

SAN JUAN RIVER BASIN

RECOVERY IMPLEMENTATION

PROGRAM

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FEBRUARY 1995

I. PROGRAM DOCUMENT

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of the San Juan River Basin Recovery Implementation Program (Implementation Program) is to protect and recover endangered fishes in the San Juan River basin while water development proceeds in compliance with all applicable federal and state laws. Endangered species include the Colorado squawfish and razorback sucker. It is anticipated that actions taken under this Implementation Program also will provide benefits to other native fishes in the Basin and prevent them from becoming endangered in the future.

The specific goals of this Implementation Program are listed below.

1. To conserve populations of Colorado squawfish and razorback sucker in the Basin consistent with the recovery goals established under the Endangered Species Act, 16 U.S.C. 1531 et seq.
2. To proceed with water development in the Basin in compliance with federal and state laws, interstate compacts, Supreme Court decrees, and federal trust responsibilities to the Southern Utes, Ute Mountain Utes, Jicarillas, and the Navajos.

This Implementation Program identifies actions and objectives needed to attain these goals and to implement recovery within 15 years. Specifically, these are identification of the elements considered necessary to achieve recovery and the means of implementing those elements. This Implementation Program has used as its foundation the Memorandum of Understanding ("MOU") which is incorporated by reference and is attached as Appendix A. It is the intent of this Implementation Program to protect the needs of the endangered species of the San Juan Basin as part of a stable and diverse ecosystem, to provide the mechanisms for proceeding with water development, and to consider the impacts of all resource development on the endangered species in compliance with all applicable laws and regulations, including the Endangered Species Act.

1.2 RECOVERY OBJECTIVES

Specific recovery objectives for threatened and endangered species are formulated by recovery teams (advisory teams of

experts established under Section 4 of the Endangered Species Act) and are effective after approval by the U.S. Fish and Wildlife Service ("Service"). The actions to achieve those objectives may fall within the purview of a recovery implementation team. It is the goal of this program to implement the recovery actions delineated in the existing recovery plan formulated for Colorado squawfish and, when final and approved, the actions set forth in the recovery plan to be formulated for the razorback sucker. Considerable research and planning will be required to maximize the effectiveness of this Implementation Program's actions for the Colorado squawfish and razorback sucker. However, the Participants in this Implementation Program recognize that quick action will be required, and delay must be minimized in order to protect the remaining fish, improve their status as quickly as possible, and allow water development to proceed efficiently in compliance with all applicable laws.

General recovery objectives for Colorado squawfish have been identified in the amended Colorado Squawfish Recovery Plan approved by the Service August 6, 1991. These objectives are:

- 1) Establish and protect self-sustaining populations in their natural habitat throughout the current range of the Colorado squawfish.
- 2) Legally protect habitat and remove the threat of significant fragmentation.

Recovery objectives for the razorback sucker have not been identified for the recently listed species but may include the following:

- 1) Capture specimens and provide refugia for representatives of presumable genetically distinct populations.
- 2) Maintain and enhance wild populations in their natural habitats.
- 3) Augment, if necessary, extant populations.

Specific species recovery goals will be developed for the San Juan River basin using information developed as part of this Implementation Program. Such goals will be formulated by the respective recovery teams established for the endangered fish species and will be submitted to the Service for review and approval. Specific goals established will reflect the need to protect these fishes in the San Juan River, and will recognize the value, contribution, and role of these populations in recovery of the species throughout their ranges.

1.3 BIOLOGICAL BASIS FOR THE RECOVERY PROGRAM

1.3.1 Water development

The San Juan River is a major tributary of the Colorado River Basin. In 1922, the seven basin states of Utah, Colorado, Wyoming, New Mexico, Arizona, Nevada, and California signed a compact dividing the Colorado River between the Upper and Lower Colorado River basins. In 1948, the Upper Basin states (Wyoming, Colorado, Utah, and New Mexico), together with Arizona, signed an agreement apportioning the upper basin share between the states. Arizona was apportioned 50,000 acre-feet in that agreement. Each of the States and the Bureau of Reclamation under the authority of the Colorado River Storage Project Act (CRSP), initiated the development of the waters of the Upper Colorado River basin. The passage of the CRSP Act allowed for the construction of many large mainstem impoundments on the Colorado River and various tributaries including Navajo Dam on the San Juan, Flaming Gorge on the Green River and the Aspinall Unit on the Gunnison River.

While the construction of these impoundments was essential for the development of water storage and flood control and to allow the Upper Basin States to develop their water resources, their construction and operation altered natural river ecosystems and, thereby, the native floral and faunal communities of the Colorado River. As a result, natural riverine habitats were altered, migration routes were blocked, and selective chemical treatments were applied to eradicate native species in favor of non-native sport fish species.

The physical and biological changes to the environment, such as the disruption of the natural flow regime and changes in water temperature and quality, that were brought about by the construction of these large mainstem impoundments, led to the endangerment of four native fish species of the Colorado River. Two of these species, Colorado squawfish and razorback sucker, inhabit the San Juan River; a third, bonytail, probably occupied the river; and the fourth, humpback chub, may have historically occurred in the river.

1.3.2 Other Human Induced Impacts

Other human-induced impacts to the Colorado River System and specifically to the San Juan River include contamination from oil and gas development and agricultural return flows which may contain heavy metals and other forms of contamination. Urban development in the Basin, with attendant urban runoff, sewage effluent, and watershed alterations have also affected the aquatic environments of the San Juan River drainage.

The cumulative effects of these and other possible impacts have resulted in reduced population levels of the native fish species,

with two species, the Colorado squawfish and razorback sucker being threatened with extinction. One other species, the bonytail, appears to be extinct in the San Juan River.

1.3.3 Consultation History

The Colorado squawfish and the humpback chub were listed in 1967 as endangered. Since the passage of the Endangered Species Act of 1973, two other species of Colorado River fishes have been listed as endangered; bonytail (1980), and razorback sucker (1991). As required under section 7 of the Endangered Species Act all actions of federal agencies that may affect these listed species must undergo consultation with the U.S. Fish and Wildlife Service. This is to insure that actions undertaken by a federal agency are not likely to jeopardize the continued existence of listed species.

Since 1977, consultations have been conducted between the Service and various federal agencies. The most significant of these consultations have been between the Service and the Bureau of Reclamation and the Bureau of Indian Affairs. Several consultations in the late 1970's and early 1980's resulted in no-jeopardy biological opinions. However, these consultations were based on limited information, before recovery goals were defined for the species, and prior to the recognition of the importance of the San Juan River populations of Colorado squawfish and razorback sucker to the overall survival of each species.

Two major projects since the early 1980's that have undergone section 7 consultation with the Service are the Animas-La Plata Project ("ALP") and Navajo Indian Irrigation Project ("NIIP"). During the section 7 process for ALP, the importance of the San Juan River population of endangered fish species was re-evaluated. The resulting "reasonable and prudent alternative" for the project was based on the premise that current and cumulative adverse conditions of the San Juan River jeopardized the continued existence of the species. In spite of the existing riverine conditions, however, a small reproducing population of Colorado squawfish persisted and razorback sucker was documented in the river.

The impacts discussed in the biological opinion for ALP focused on water depletion. However, other impacts associated with water development such as water quality degradation, contaminants from irrigation return flows, increased sediment, and temperature changes were also discussed. The same impacts were discussed and addressed in the Biological Opinion for NIIP.

It was recognized that while these impacts may be exacerbated by continued development of the waters of the San Juan River, a program or plan is needed whereby all entities that have a

potential or opportunity to recover or protect the river environment are involved. The basis for such a program was established in the biological opinion for ALP.

The San Juan River Recovery Implementation Program provides the basis for the recovery of the endangered fishes of the San Juan River. Through the efforts of this Implementation Program, current impacts will be reduced and recovery of species will be possible. Participation of federal and state agencies, Indian tribes, and special interest groups will be necessary in order for this Implementation Program to be successful.

1.4 COORDINATION WITH EXISTING RECOVERY EFFORTS

Activities conducted under this Implementation Program will be closely coordinated with the ongoing "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin." The Upper Basin Recovery Program was initiated on October 1, 1988, with the objective of recovering endangered Colorado River fishes in the Green River and Colorado River sub-basins above Glen Canyon Dam. The San Juan sub-basin was not included in that program. Recovery efforts are also underway in the Lower Colorado River Basin. Coordination with existing recovery efforts will reduce overlap and duplication of recovery efforts, allow available resources to be focused on pressing needs in the San Juan sub-basin, enhance communication of research results, and improve effectiveness of all recovery efforts.

1.5 PARTICIPATION IN THE IMPLEMENTATION PROGRAM

This Implementation Program was developed as a cooperative effort of the U.S. Bureau of Reclamation, the U.S. Bureau of Indian Affairs, U.S. Fish and Wildlife Service, the States of Colorado, New Mexico, and Utah, the Navajo Nation, the Southern Ute Indian Tribe, the Ute Mountain Ute Indian Tribe, the Jicarilla Apache Indian Tribe, local government, and non-federal water development interests. Participation in this Implementation Program does not in any way diminish, detract from, or add to the Secretary's ultimate responsibility for administering the Endangered Species Act, nor is it intended to affect the authorities and responsibilities of the states and the tribes to manage and administer their water and fish and wildlife resources. The parties have to make independent judgments in determining whether or not they will carry out the determinations of the Coordination Committee. Each of the above entities, and any federal agency which is added to the Coordination Committee pursuant to the procedures described in Section 5.1.1 of this Implementation Program, are referred to as the "Participants."

Federal entities not listed above, through the implementation of authorities and responsibilities under section 7(a)(1) of the Endangered Species Act, may request to participate in this Implementation Program. Such agencies will be provided the opportunity to submit their reasons, and their ability to meet the criteria for such participation to the Coordination Committee for approval. Other federal entities may be required by the Service to participate in this Implementation Program as a result of consultation under section 7(a)(2) of the Endangered Species Act. The specific criteria for such participation are listed in Section 5 of this Implementation Program.

Although not formal, voting participants in this Implementation Program, any member of the public may attend the open meetings of the Committees and present his or her concerns or recommendations for consideration by Implementation Program Participants.

In order to carry out this Implementation Program, three committees will be established: a Coordination Committee, a Biology Committee, and a Navajo Dam Operating Committee. The composition and functions of each committee are discussed in Section 5.0.

Participation in this Implementation Program is voluntary. Each Participant will assess whether Implementation Program goals are being achieved. If any Participant decides not to continue, that Participant will submit its reason(s) to the Coordination Committee in writing. The Coordination Committee will be given sufficient time to resolve any problem(s). If participation in this Implementation Program is essential to implementing a reasonable and prudent alternative to avoid jeopardy to the endangered fish species, a Participant's withdrawal may result in reinitiation of consultation under section 7 of the Endangered Species Act.

1.6 TRUST RESPONSIBILITIES

The reservations of four federally recognized Indian tribes are located within the Basin. The four tribes have reserved water rights under federal law, most of which have not been quantified, to provide water to the reservations for use as permanent homelands. The Secretary of the Interior has a trust responsibility to assert and protect the trust water resources of the tribes.

With regard to three of the four tribes, there currently are specific federal plans for the partial development of tribal water resources. Under the Act of June 13, 1962, 76 Stat. 96, Congress authorized, among other things, the construction of NIIP to benefit the Navajo Nation. Based on congressional actions, six of the NIIP's 11 blocks have been fully constructed and

Blocks 7 and 8 are currently under construction. Congress has consistently provided annual appropriations for NIIP's completion.

On June 30, 1986, the Under Secretary of the Interior signed an agreement which established the principles for settlement of the reserved water right claims of the Southern Utes and Ute Mountain Utes and the financial arrangements for the settlement and for the construction of ALP. The nonfederal cost sharing commitments contained in the agreement were in satisfaction of the cost sharing requirements of chapter IV of Public Law 99-88, 99 Stat. 293, 319-320. This agreement provided the basis for the Colorado Ute Indian Water Rights Final Settlement Agreement, dated December 10, 1986 ("Settlement Agreement"), which contemplates delivery of the tribes' full water supply from the Animas-La Plata Project by the year 2000. The Settlement Agreement was endorsed by Congress in the Colorado Ute Indian Water Rights Settlement Act of 1988, 102 Stat. 2973, ("Settlement Act") and initial appropriations have been made by Congress.

The Jicarilla Apache Tribe and the United States have been engaged in lengthy litigation to establish the quantities of water to which the tribe is entitled. Recently, in accordance with federal policy, the tribe has participated in extensive negotiations to resolve the issues surrounding the full extent of its water rights. The Department of the Interior has been a key participant in those discussions which have focused on providing the tribe with a water supply from the Basin.

The Department of Interior intends to use its authority to the fullest extent possible to preserve and protect the water resources of the tribes in the Basin. A goal of this Implementation Program is to conserve the listed fish in the Basin while meeting the Department's trust responsibilities to the tribes.

1.7 WATER RIGHTS

Nothing in this Implementation Program shall be construed to affect the right to use water under any federal or state law or permit, federal contract, treaty, interstate compact or the right of any party in any adjudication proceeding to determine rights to use water or to contract for water.

The Indian tribes do not recognize that their water rights are limited by any agreement that the States have made to apportion water in the Colorado River Basin, including the Upper Colorado River Basin Compact (63 Stat. 31). Therefore, the participation in the MOU or this Implementation Program by any Indian tribe shall not waive any tribe's claim to water in excess of any allocation to any particular State or be deemed to bind any tribe

to the terms of any agreement to which it is not a party. The signatories to the MOU and this Implementation Program disagree as to whether or not the Indian tribes have water rights which are limited by or subject to any agreement among the States to apportion the waters of the Colorado River Basin, including the Upper Colorado River Basin Compact. Nothing in the MOU, the Cooperative Agreement, or this Implementation Program shall be deemed to be a recognition or acceptance of any such claims by any party hereto or be deemed to establish or affect any such claims.

This Implementation Program is intended to provide the means for conserving the endangered fish species in the Basin while water development proceeds consistent with applicable laws. The order in which water development occurs may not necessarily reflect the priority of the water rights. Therefore, the successful development of any water project in accordance with this Implementation Program does not create a water right for project beneficiaries or its contractors to the use of water greater or lesser than those to which the project beneficiaries or contractors would otherwise be entitled, nor shall such development of a project adversely affect the water rights of any other water users or water right holders in the Basin.

1.8 COOPERATIVE AGREEMENT

The Secretary of the Interior, on behalf of the U.S. Fish and Wildlife Service (Regions 2 and 6), U.S. Bureau of Reclamation, and U.S. Bureau of Indian Affairs; the Governors of Utah, Colorado and New Mexico; the Navajo Nation, and the Southern Ute Indian Tribe, the Ute Mountain Ute Indian Tribe, and the Jicarilla Apache Indian Tribe have executed a Cooperative Agreement to carry out this Implementation Program. The Cooperative Agreement incorporates the terms, objectives, and undertakings of this Implementation Program and commits each party to its timely implementation. The Cooperative Agreement has been executed under the statutory authority of the Endangered Species Act and other appropriate state, federal, and tribal laws. All entities which have signed the Cooperative Agreement are referred to in this Implementation Program as the "Signatories."

1.9 RELATIONSHIP OF RECOVERY IMPLEMENTATION PROGRAM TO SAN JUAN RIVER RESEARCH PLAN

In accepting the reasonable and prudent alternatives provided in the October 25, 1991, Biological Opinion issued by Region 6 of the Service on the Animas-La Plata Project, the Bureau of Reclamation agreed to fund approximately 7 years of research on

the San Juan River and its tributaries with emphasis on observing a biological response in the endangered fish population and habitat conditions. As stated in this Biological Opinion, this research "will be conducted by knowledgeable endangered species and habitat experts and will allow for testing of hypotheses. The ultimate goal of this research is to characterize those factors which limit native fish populations in the San Juan River and to provide management options to conserve and restore the endangered fish community. Approval for study design shall jointly rest with the Service and Reclamation." This Biological Opinion also anticipates (and provides) for potential sharing by all Participants of the responsibility for funding of the research and all other recovery activities for the endangered fish species of the San Juan River following establishment of this Implementation Program.

As a result of the section 7 consultation for the Navajo Indian Irrigation Project, Blocks 1 through 8, the Bureau of Indian Affairs has agreed to assist with funding and participate in the research effort initiated by the Bureau of Reclamation.

The research effort, initiated in 1991, is incorporated into the research requirements of this Implementation Program and forms the core of this Implementation Program's investigations. However, this Implementation Program will not be limited either to the scope of the initial research effort or to the research period.

2.0 BACKGROUND

The San Juan River sub-basin is the second largest of the three sub-basins which comprise the Upper Colorado River basin (Figure 1). The San Juan River sub-basin drains about 38,000 square miles of southwestern Colorado, northeastern Arizona, northwestern New Mexico, and southeastern Utah. From its origins in the San Juan Mountains of Colorado, the San Juan River flows some 31 miles to the New Mexico border, 190 miles westward to the Four Corners area, and thence another 136 miles to Lake Powell. In its upper reaches, the river traverses rugged terrain and has a relatively high gradient. The river emerges from canyon-bound reaches shortly after entering New Mexico and flows through a broad floodplain for much of its course in New Mexico and Utah. About 70 miles upstream of Lake Powell, the river again enters canyon reaches for the remainder of its course. The river is generally restricted to a single channel in canyon portions, but is often divided into several channels in floodplain reaches.

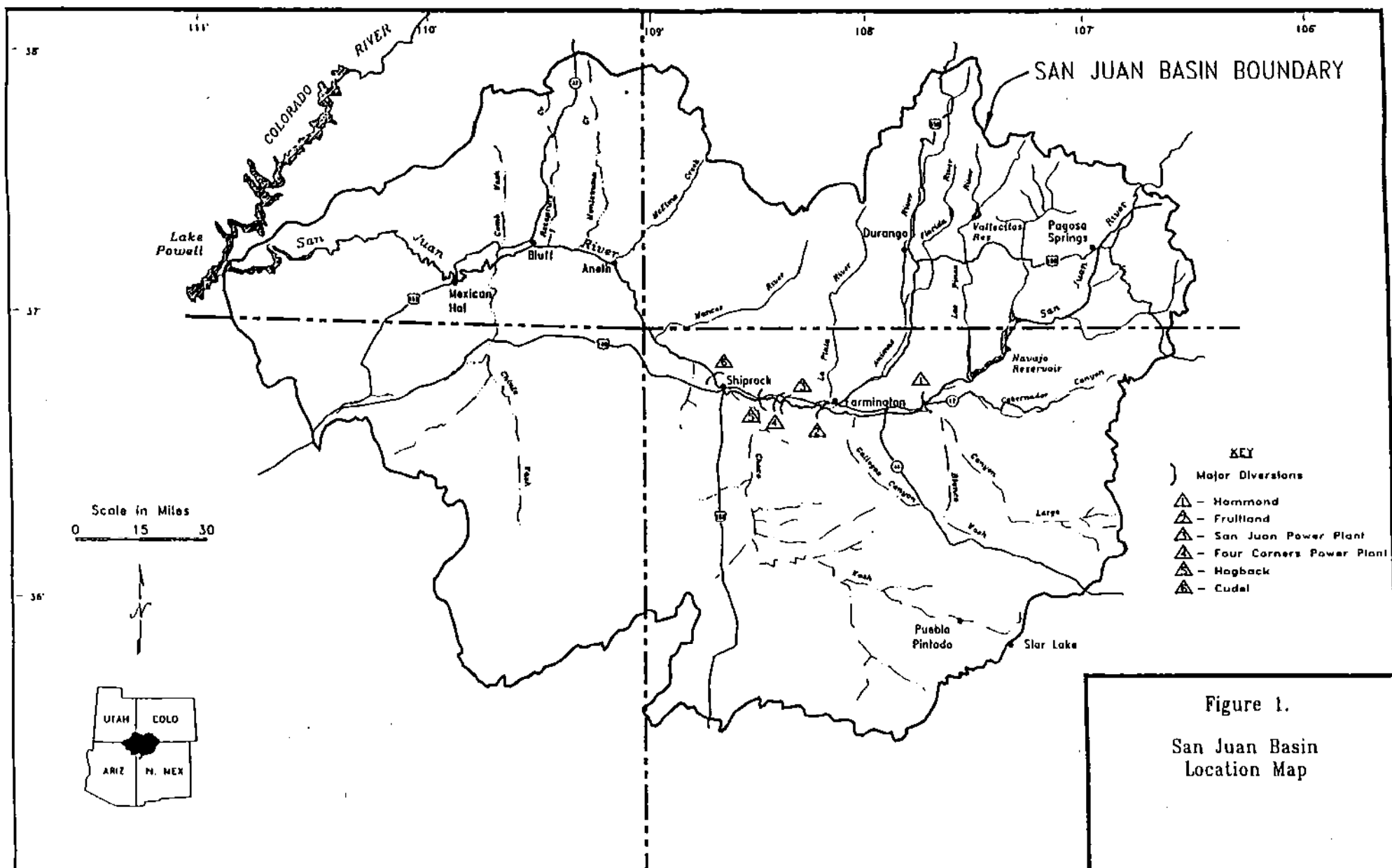
The San Juan River has comparatively few perennial tributaries, most of which are in upper reaches. Historically, Los Pinos, Piedra, Navajo, Animas, La Plata, and Mancos rivers, Rio Blanco, and McElmo Creek were the only perennially flowing tributaries. Other streams such as Montezuma and Chinle creeks seasonally contributed flows. Numerous washes and arroyos also entered the river, but none provided regular flow. Among tributaries, the Animas River contributed the greatest flow.

2.1 FISH FAUNA

2.1.1 Native Fish Fauna

Ichthyofaunal surveys of the San Juan basin prior to extensive European settlement were very limited. This work, nevertheless, documented the occurrence of at least eight and possibly nine native fish species (Table 2.1): cutthroat trout, roundtail chub, Colorado squawfish, speckled dace, flannelmouth sucker, bluehead sucker, razorback sucker, and mottled sculpin. Based upon two specimens and skeletal remains in Native American middens, bonytail chub may also have inhabited the river. Of these, Colorado squawfish, razorback sucker, and bonytail chub are listed as endangered under the authority of the Endangered Species Act of 1973, as amended. In addition, New Mexico lists roundtail chub as endangered; Colorado classifies the flannelmouth sucker, bluehead sucker, and roundtail chub as species of special concern; and Utah lists the roundtail chub and Colorado River cutthroat trout as sensitive species.

Although Colorado squawfish was reported in the San Juan Drainage prior to 1900, the first confirmed records were not until 1936 when three juveniles were captured at Alcove Canyon, Utah.



Thereafter, specimens were taken from several locations in Utah, Colorado, and New Mexico. During a three-year study initiated in 1987, 10 adult and 18 young-of-year specimens of Colorado squawfish were captured. This effort documented the persistence of the species from about Shiprock, New Mexico, downstream to Lake Powell and successful reproduction in New Mexico and Utah. Subsequently, nine additional specimens of Colorado squawfish were captured between Shiprock and Four Corners in 1991 and one was observed about 5 miles upstream of Shiprock.

Razorback sucker was reported ascending the Animas River in the 1890's, but specimen confirmation of its presence in the San Juan Drainage was not made until 1976 when two adults were found in a floodplain pond near Bluff, Utah. During the 1987-1990 study, adults of razorback sucker were collected in the San Juan arm of Lake Powell and a single male was found near Bluff, Utah.

Occurrence of bonytail chub in the San Juan Drainage is uncertain as the record consists only of skeletal remains from Native American middens and two questionable specimens collected prior to 1930. One specimen is a hybrid of roundtail chub and another chub species (possibly bonytail or humpback chub) and the second has not been critically examined.

Among the remaining six native fish species, all persist in the drainage. Cutthroat trout (Colorado River subspecies) survives in several isolated headwater tributaries. Roundtail chub is extremely rare in the San Juan and Animas rivers, but may be more common in other streams (Los Pinos, Piedra, and Mancos). Mottled sculpin occurs mainly in the Animas River, but is not common. Speckled dace is generally distributed in the drainage, particularly in upper tributaries, the Animas River, and San Juan River upstream of Bluff. Flannelmouth and bluehead suckers inhabit most reaches of the San Juan and Animas rivers as well as lower reaches of some tributaries.

Table 2.1. Native Fish Fauna of the San Juan River Basin

Species	Status
Colorado River Cutthroat Trout	CO
Roundtail Chub	NM
Bonytail Chub	E
Colorado Squawfish	E, CO, NM, UT
Speckled Dace	C
Flannelmouth Sucker	A
Bluehead Sucker	A
Razorback Sucker	E, CO, UT
Mottled Sculpin	R

E = Endangered, United States

CO = Protected, Colorado

NM = Protected, New Mexico

UT = Protected, Utah

A = Abundant, generally distributed and typically numerous

C = Common, generally distributed but typically not numerous

R = Rare, not generally distributed and never numerous

2.1.2 Non-native Fish Fauna

Since the late 1800's, at least 40 non-native fish species have been introduced to the Upper Colorado River Basin. In the San Juan River sub-basin, 23 non-native fish species have been reported (Table 2.2). Of these, 21 have been documented in the San Juan River since 1987. In warmwater reaches of the mainstem San Juan River, common carp and channel catfish were the only common and generally distributed non-native fish species. Rainbow, cutthroat (Snake River subspecies), and brown trouts were common in coldwater reaches of the San Juan River (including the Navajo Dam tailwater reach) and its upper tributaries. Red shiner, fathead minnow, and mosquitofish were the most common non-native species found in low-velocity habitats associated with the mainstem San Juan River. Other non-native fish species, such as black bullhead, plains killifish, green sunfish, and largemouth bass, were very rare and several probably derived from upstream or downstream or off-channel impoundments.

Some non-native fish species were introduced by federal, state, and tribal agencies to establish food or recreational fisheries while others became established as a result of bait minnow, fishermen, or accidental releases. In New Mexico and Utah, stocking of non-native warmwater species has been discontinued, but non-native salmonids are still stocked in suitable habitats in Colorado and New Mexico (including the Navajo Dam tailwater

reach).

Table 2.2. Non-native Fish Fauna of the San Juan River Basin

Species	Status
Threadfin Shad	LP
Cutthroat Trout (Snake River subspecies)	UC
Rainbow Trout	C
Brown Trout	C
Kokanee Salmon	NR
Northern Pike	LP, NR
Red Shiner	C
Common Carp	A
Golden Shiner	NR
Sand Shiner (Undocumented)	--
Fathead Minnow	UC
White Sucker	R
Black Bullhead	R
Channel Catfish	A
Plains Killifish	UC
Mosquitofish	C
Striped Bass	LP
Green Sunfish	R
Bluegill	R
Smallmouth Bass	R
Largemouth Bass	R
White Crappie	LP, NR
Black Crappie	NR

A = Abundant, generally distributed and typically numerous
 C = Common, generally distributed and typically not numerous
 UC = Uncommon, not generally distributed and typically not numerous
 R = Rare, not generally distributed and never numerous
 LP = Lake Powell, may rarely enter riverine habitats
 NR = Navajo Reservoir, may rarely enter riverine habitats

2.2 WATER DEVELOPMENT

2.2.1 Historic Flows

The San Juan River is a typical southwestern river, exhibiting highly variable natural flows, both annually and monthly. Mean annual discharge from 1914 to 1986 was 2,574 cubic feet/second (cfs) near Bluff. High flows of 69,986 cfs and low flows of 0 cfs have been recorded at the Bluff, Utah, gage.

Prior to the construction of Navajo Dam, the hydrograph was

characterized by large spring peaks and low base flow. Typically, spring runoff began in March, peaked in mid-May to early June and ended by the first week of July. Flow the remainder of the year was characteristically low, punctuated by large, short duration peaks caused by summer and fall storm events.

Since the completion of Navajo Dam in 1962, flows below Navajo Reservoir have been largely controlled and stabilized. Spring peak flows have been significantly reduced in magnitude, base flows have been increased and stabilized, and late winter flows have increased markedly to provide storage space in the reservoir for the spring runoff. In addition to moderating natural flows, hypolimnetic releases from Navajo Reservoir have decreased mean annual water temperature and diminished temperature fluctuations of the San Juan River downstream to near the confluence of the Animas River.

From Navajo Dam to Lake Powell, the river is supplemented by perennial and ephemeral tributary streams, arroyos, and washes, and diverted for use by industry, municipalities, and agricultural irrigation. The inflows below Navajo Dam provide the main variation in flow, including thunderstorm peaks and a typically shaped but reduced magnitude spring runoff.

2.2.2 Development and Depletions

There are many points of water diversion, including a number of pumps on the San Juan River between Navajo Dam and its confluence with Lake Powell. Downstream of the dam, water is diverted for the Hammond Canal, Farmers Mutual Ditch, Fruitland Irrigation Canal, San Juan Power Plant, Jewett Valley Ditch, Four Corners Power Plant, Hogback Canal, Cudei Ditch, and a few lesser water users. A portion of the diversion for the Four Corners Power Plant is returned to the San Juan River via Chaco Wash. Additional return flows enter the San Juan River from irrigation and municipal diversions, the Animas River, the La Plata River, the Mancos River, McElmo Creek, and Montezuma Creek. Irrigation-return flow from Dolores River diversions enters the San Juan River via Mancos River and McElmo Creek, augmenting the natural flows of the San Juan River.

There are six diversion structures in New Mexico on the mainstem San Juan River, five of which are downstream of Farmington. Each is a potential impediment to fish movement, particularly during low flow periods. The diversion structures range from soil and boulder dikes to concrete and metal weirs over which the entire river flows. The most upstream of these obstructions is a levee at the head of the Hammond Canal, upstream of the confluence with the Animas River. The second is located just above the confluence of the San Juan and La Plata rivers that diverts water into Fruitland Irrigation Ditch. The San Juan Power Plant

diversion structure is located just downstream of Fruitland. The entire river passes over this structure, except at abnormally high flows, when a portion of the river flows around the weir and may allow upstream movement of fish. The Four Corners Power Plant pump station, with its associated weir, is located 3 miles downstream of the concrete weir at Fruitland. The Hogback diversion dam is the next major structure across the river. It was passable by fish until September 1987, when it was reconstructed and all flow was diverted into the Hogback Canal at low flow with excess water released back to the river a short distance downstream. The furthest downstream diversion, at Cudei, is the only one below Shiprock. There are no major diversion structures that would impede fish passage on the mainstem San Juan River downstream of Cudei.

These diversions, as well as other diversions from the San Juan River and its tributaries in New Mexico, Colorado and Utah with the associated return flows, result in a net depletion of the San Juan River flow of up to 657,200 acre feet annually. The net depletion at Bluff, Utah, is reduced to 632,200 acre feet by return flow from projects that divert water from the Dolores River, but return water to the San Juan River. These baseline depletions and return flows are shown in Table 2.3.

Table 2.3. Present Baseline Depletions from San Juan River.¹

<u>Project</u>	<u>Depletions - KAF</u>	<u>Totals - KAF</u>
<u>New Mexico Depletions (excluding Animas-LaPlata Project)</u>		
San Juan-Chama	110.0	
NIIP Blocks 1-6	133.0	
Navajo Reservoir Evaporation	26.0	
Hammond Canal	10.0	
Hogback Extension	10.0	
Utah International	39.0	
Existing Private Rights	101.0	
Citizen's Ditch	15.0	
Industrial Diversion	3.0	
Fruitland	7.0	
Jewitt Valley	2.0	
M&I Diversions	5.0	
Hogback	30.7	
Additional Depletions	38.3	
M&I Contracts from Navajo		
San Juan Powerplant	16.0	
Total New Mexico Depletions		445.0
<u>Colorado Depletions (excluding Animas-LaPlata Project)</u>		
Upstream of Navajo	78.9	
Upper San Juan	7.8	
Navajo-Blanco	6.5	
Piedra	6.5	
Pine River	58.1	
Downstream of Navajo	67.1	
Florida	18.1	
Animas & LaPlata Rivers	32.8	
Mancos	16.2	
Total Colorado Depletions		146.0
<u>Animas-LaPlata Project Depletions</u>		57.1
<u>Utah Depletions</u>		
McElmo Creek	0.2	
Montezuma Creek	3.2	
Cottonwood, Recapture, Comb	3.9	
San Juan	1.8	
Total Utah Depletions		9.1
Total San Juan River Depletions		657.2
Return flows from Dolores River Imports		25.0
Net Depletions Measured at Bluff Utah		632.2

¹ New Mexico and Colorado depletions from Animas LaPlata Biological Opinion. Utah depletions from Hydrologic Inventory of Colorado, Dolores and San Juan Study Units, Utah Div. Water Resources, Sept 1987.

2.3 WATER QUALITY

The water quality of the San Juan River, from its impoundment behind Navajo Dam to its confluence with Lake Powell, is influenced by both natural and anthropogenic factors, exhibiting the results of these influences both longitudinally and seasonally as it flows through the habitat occupied by the endangered fish species. Of particular concern for this Implementation Program are the levels and effects of elemental contaminants such as selenium, the levels of which are influenced by natural baseline conditions as well as agricultural development within the Basin.

The San Juan Basin is considered naturally seleniferous, as is much of the western United States. Historic data concerning concentrations of selenium in the mainstem of the San Juan River indicate a general increase in levels with distance downstream from Archuleta, New Mexico (downstream of Navajo Dam) to Bluff, Utah, (<1 ug/l to 4 ug/l). Tributaries to the San Juan carry higher concentrations of selenium than found in the mainstem river immediately upstream from their confluence with the San Juan; although these levels are diluted by the flow of the San Juan, the net effect is a gradual accumulation of the element in the river's flow as it travels downstream. Increased selenium concentrations may also result from the introduction of groundwater to the mainstem of the river along its course.

Irrigated agriculture is known to contribute the element to the river via surface and subsurface return flows through three potential avenues: 1) concentration of selenium in the irrigation water by evaporation, 2) selenium pickup from the soils that are irrigated, and 3) selenium pickup in the shale beds underlying the irrigated areas.

Development of the oil and gas resources of the Basin, as well as other factors including but not limited to urban runoff, domestic and industrial sewage effluents, and spillage of petroleum and petroleum products, have contributed to the presence of polycyclic aromatic hydrocarbons in the biota of the San Juan River. Sampling of fish species from the San Juan River in 1990 and 1991 suggest that aquatic organisms are being exposed to high levels of hydrocarbons such as naphthalene, benzo(a)pyrene, and phenanthrene.

Other environmental contaminants, their individual effects on the endangered fish species of the San Juan River, or their synergistic or antagonistic effects in the presence of naturally occurring or introduced elements or compounds have not been the subject of site or species specific investigations.

3.0 RESEARCH AND RECOVERY ELEMENTS AND RECOVERY PROGRAM IMPLEMENTATION

Given the common goal of conserving endangered fish species and their habitats while water resource development proceeds in the San Juan River basin consistent with applicable laws, a comprehensive program is required to address both. All Participants recognize that both the biological requirements of the endangered fish species and the management of San Juan River Basin waters are complex. Therefore, a broad range of measures are proposed herein to enable a cooperative effort to identify and quantify factors which limit the abundance and survival of endangered fishes, to develop strategies to improve their status and means to evaluate the success of such endeavors, and to recover and delist the species under the authority of the Endangered Species Act.

The essential research elements describe the basic research upon which much of the subsequent research and recovery activities will be based. The recovery elements define the major categories of activities that will be conducted to recover endangered fish species and maintain the native fish community in the San Juan River basin. Research efforts will be directed toward obtaining the information needed for identification of factors that might act to limit the recovery of the Colorado squawfish and razorback sucker. Based upon that information, an analysis of actions to remove or diminish such limiting factors and promote recovery will be accomplished. These actions will be considered, evaluated, consulted upon, and implemented if found to be necessary and effective. Such actions include but are not limited to habitat modification (e.g., flow or non-flow induced improvement of low velocity habitats or side channels), artificial control of non-native species, artificial propagation of native species for augmentation of existing natural populations and reintroduction into historic habitat, modification or removal of impediments to fish movement, and improvement in water quality. Any action undertaken with the goal of contributing to the recovery of the endangered fish species will be closely monitored to evaluate the efficacy of the approach.

3.1 ESSENTIAL RESEARCH FOR LONG RANGE PLAN AND PROGRAM GOAL DEVELOPMENT

3.1.1 Statement of Problem

A small reproducing population of Colorado squawfish persists in the San Juan River. Since 1987, 21 adult specimens of Colorado squawfish have been captured and several others observed between Bluff, Utah and the Hogback, New Mexico. In 1987, 1988, and 1990, young of year squawfish were collected downstream of

Shiprock, near Bluff, and in the inflow area of Lake Powell. One adult Colorado squawfish was also collected in the San Juan Arm of Lake Powell.

Only one razorback sucker has been collected in the San Juan River since systematic research began in 1987. During that period, however, several specimens of razorback sucker were captured in the San Juan River inflow area of Lake Powell. Many of the specimens of razorback sucker captured were in spawning condition, but no reproduction or recruitment was documented.

Although archaeological evidence and two specimens (of unconfirmed identity) indicate bonytail historically occupied the San Juan River, no individuals have been captured since systematic investigations began in 1987.

Adults of Colorado squawfish are found in habitats ranging from low-velocity interfaces of tributary mouths and the San Juan River to main channel, rapid velocity deep runs. Within the San Juan River, the extent and success of annual spawning, recruitment, or survival of young Colorado squawfish has not been determined. Spawning is believed to occur in the San Juan River during July and perhaps August. The location of spawning areas in the San Juan River is not known, but successful Colorado squawfish reproduction does occur when conditions are favorable in the river as was evidenced during the 1987, 1988, and 1990 surveys. Young-of-year Colorado squawfish are typically captured in shallow backwater or side-channel habitats with silt and sand substrates and little or no current.

Adults of razorback sucker normally inhabit a variety of habitats including quiet eddies, pools, and mid-channel runs. They are usually found over a sand or silt substrate, but can also occur over gravel and cobble bars in the spring during spawning. Spawning may occur in Lake Powell, or lowermost San Juan River, but recruitment of young-of-year razorback sucker has not been documented in the San Juan River.

Within the river, the overall range of Colorado squawfish and razorback sucker and that of individuals of each species are not known. The extent or types of habitat normally occupied by adults of either species in the San Juan River is poorly known. Spawning and nursery habitats of neither species have been identified or characterized.

3.1.2 Course of Action

3.1.2.1 Research

- a. Intensive studies will be conducted to determine the relative abundance and distribution of endangered fishes,

other native, and non-native fishes. These studies include, but are not limited to, adult monitoring/radio telemetry investigations, ichthyofaunal surveys of tributary streams, and secondary channel ichthyofaunal characterizations.

- b. Reproduction and recruitment, if any, will be documented. Areas of reproductive activity and nursery habitats will be identified and characterized. This information will be used to evaluate responses to different volumes of water released (including timing and duration) from Navajo Dam and to identify areas of essential habitat.
- c. Seasonal and longitudinal distribution of endangered, other native, and non-native fish species will be documented in response to various flow releases from Navajo Dam. Habitats important to maintenance of other native and non-native fish species will be identified and characterized in relation to different flow regimes.
- d. Information gathered will be utilized as the foundation for identifying and evaluating the need to implement other recovery actions, including, but not limited to, habitat modification (flow or mechanically induced) and population augmentation.
- e. Monitor and evaluate on a regular basis any recovery action implemented as a result of this research.

3.1.2.2 Recovery

- a. The Program Coordinator and the Biology Committee will cooperatively develop a long range plan to enable achievement of recovery of the endangered fish species of the San Juan River basin.
- b. Develop population recovery goals for San Juan River endangered fishes consistent with the approved Colorado Squawfish Recovery Plan, the recovery plan to be prepared for the razorback sucker, and Upper Basin Recovery Implementation Program.

3.2 PROTECTION OF GENETIC INTEGRITY AND MANAGEMENT AND AUGMENTATION OF POPULATIONS

3.2.1 Statement of Problem

The relative genetic distinctiveness of the San Juan River populations of Colorado squawfish and razorback sucker have not been determined. At critically low levels, the populations of these species may be vulnerable to adverse demographic or environmental events which severely diminish genetic variability

or population survival potential. Indeed, the population of razorback sucker may be at such low levels in the San Juan River basin that natural recruitment to self-sustaining levels may not be possible. These populations, particularly that of the razorback sucker, may also be of such low levels that monitoring responses to test flows in the San Juan River in order to identify the habitat flow needs of the species is impaired, and habitat use by these species cannot be documented.

3.2.2 Course of Action

3.2.2.1 Research

- a. Obtain tissues following protocol developed by the Service (Upper Basin Recovery Implementation Program) and, based upon appropriate assays, genetically characterize and evaluate relationships of populations of San Juan River endangered species to those of other basins.
- b. Evaluate efficacy of using neutered fish to locate spawning habitats and aggregations of wild populations of endangered fish species.
- c. Utilizing data concerning current distributions and abundance of each species, evaluate reproductive and recruitment potentials of each, consider results of genetic studies, and evaluate the need to establish protected gene pools of each.
- d. Monitor and evaluate on a regular basis the success (or failure) of any recovery action implemented as a result of this research.

3.2.2.2 Recovery

- a. If necessary, establish refugia with stock taken from the wild.
- b. Evaluate the need to augment wild populations of endangered fish species and, if necessary, develop hatchery propagation programs. Augment wild populations of both or either endangered fish species if deemed necessary, desirable, and likely to improve status.
- c. Evaluate the need and efficacy of cryogenic gamete preservation; implement if feasible.

3.3 PROTECTION, MANAGEMENT, AND AUGMENTATION OF HABITAT

3.3.1 Statement of Problem

Modification and loss of habitat have contributed to the decline of the Colorado squawfish and razorback sucker in the San Juan River. For example, young-of-year Colorado squawfish are most often found in low-velocity nursery and feeding habitats such as backwaters and side channels. Paucity of such habitats or water quality may be limiting recruitment. These habitats can be created and seasonally maintained by manipulating river flow.

Regulation structures such as Navajo Dam can be operated to control river flow and temperature to maximize the quantity and quality of habitats in certain river reaches during periods when they are most critical to the endangered fish species. These habitats can also be developed by connecting existing side channels, gravel pits or ponds to the river through the provision of beneficial flows or channel modification. The trade-offs of providing this habitat through flow manipulation or channel modification will be examined in light of the dual goals of this Implementation Program, with emphasis on providing the habitat in the most effective manner.

Recovery of these species may be aided by protecting or enhancing habitat through management techniques, such as habitat flow management, protection of habitats and flow, or other measures. First, however, the quantity and quality of available habitats must be assessed, and based upon this information, decisions can be made as to how to best achieve the desired results.

Federal, state, local, and tribal agencies will work cooperatively and expeditiously to quantify, protect, manage and, where appropriate, augment flows and habitats of the San Juan River. The water needed to provide flows for the recovery of endangered fish species (habitat flows) will be protected under this Implementation Program in a manner consistent with all state and tribal laws.

3.3.2 Course of Action

3.3.2.1 Research

Important reaches of the San Juan River for different life stages of the endangered fishes will be identified. Those reaches will be monitored during releases of test flows from Navajo Dam to determine habitat quality and characteristics over an array of flow regimes and to identify and quantify the response of the endangered fish species to specific flows at these locations. In addition, responses of other native and non-native fish species will be characterized. The research necessary for this effort is

listed below:

- a. Characterize existing geomorphic and habitat conditions of the river preparatory for detailed habitat quantification and characterization.
- b. Identify reaches of the river with similar geomorphic and habitat conditions.
- c. Determine usage of specific habitats by endangered fishes as well as other native and non-native species.
- d. Quantify habitat availability and characteristics at different flows to assist in the determination of the biological response of endangered fish species to test flows in the San Juan River. Evaluate the biological response of other species.
- e. Physical habitats will be characterized, quantified, and correlated to flow conditions.
- f. Complete detailed habitat mapping of representative sub-reaches, including hydraulic characteristics for later modeling.
- g. Assess dynamics of the geomorphology of the river and the effects of flow on changes in geomorphology and habitat.
- h. Model flow-habitat relationships.
- i. Monitor fate and usage by all species of habitats maintained or created by flow regimes, or other means. Evaluate need to continue management practices initiated as a result of this research.

The quantification and characterization of habitats and their use by various life stages of the endangered fish species will be dependent upon other research and recovery elements.

3.3.2.2 Recovery

- a. Information gathered will be utilized to identify specific actions and to evaluate the need for physical modification of habitats to aid in the recovery of the endangered fish species.

If habitat modification actions are to be implemented (including, but not limited to, removal of impediments to fish passage, or creation of required but unavailable habitats), appropriate permits, National Environmental Policy Act, Clean Water Act, and

Endangered Species Act compliance will be acquired or completed.

- b. After determining appropriate flow needs, the Biology Committee, with input from the Navajo Dam Operating Committee, will recommend specific flow regimes to the Service. This information will be utilized by the Service in coordination with the Bureau of Reclamation to determine reservoir releases needed for the endangered fish species.
- c. It is anticipated that the source water for habitat flows will be derived mainly from the operation of Navajo Dam and other sources. Based upon the results of the research accomplished under this Implementation Program, the Bureau of Reclamation has agreed to operate Navajo Dam to mimic a natural hydrograph for the life of the Animas-La Plata Project, provided that the research shows that this type of hydrograph is beneficial to recovery of the endangered fish species. The quantities of water needed for recovery may be greater or lesser than the quantities discussed in the Biological Opinion issued for the Animas-La Plata Project. These flows are dependent upon what is ultimately determined to be needed to achieve recovery of the endangered fish species.
- d. If habitat flow needs are identified that cannot be met by reoperation of Navajo Dam, potential sources of water to meet those needs will be identified on a case-specific basis. Obtaining the water from other sources will be the responsibility of the Participants in this Implementation Program or other affected entities and will occur in accordance with the following process:
 - 1. Once habitat flow needs have been quantified, the Service will request from staffs of the appropriate state and tribal agencies and others recommendations on the physical and legal means for providing the desired habitat flows. The alternatives will be provided, together with estimates of costs, methods of implementation, time frames, and procedural requirements to the Implementation Program Participants.
 - 2. Implementation Program Participants will review the available alternatives, prepare recommendations, and implement the recommendations through cooperative efforts under the auspices of this Implementation Program. The Service, in

cooperation with the Bureau of Reclamation and responsible state and tribal entities, will subsequently monitor the efforts of all Participants to ensure that the required habitat flows are provided.

3. Water rights acquired under the auspices of this Implementation Program will not be acquired through condemnation. If these rights are held by an entity other than the Service, the Service must be assured that the protection of such water rights will be enforced.
 4. Habitat flows will be administered by the respective State Engineers and tribal authorities pursuant to state and tribal laws.
- e. The success of this Implementation Program is contingent upon the legal protection of water for habitat flows pursuant to federal, state, and tribal laws. The Signatories to the Cooperative Agreement agree that, to the extent of their jurisdiction and within the context of their respective legal authorities and subject to existing developed rights, their government will protect storage releases from Navajo Reservoir and any other water acquired under this Implementation Program for the benefit of listed fish so that the flows remain undiminished, except for carriage losses, to and through the habitat of endangered fish species to Lake Powell. The authorities by which this will be achieved by the Navajo Nation and the States of Colorado, Utah, and New Mexico is described in Appendices B through E.
- f. There are no shortages anticipated to the water supply for the depletions identified in the baseline for the Animas-La Plata Project during the research period.

Upon completion of, or during the research period, the water flow requirements of the endangered fish species will be analyzed and the issue of shortages, if any, will be addressed by the Coordination Committee under this Implementation Program. If the issue of shortages is not resolved under this Implementation Program, the issue will be considered as new information which may result in reinitiation of consultation and will be resolved through the section 7 process.

3.4 WATER QUALITY PROTECTION AND ENHANCEMENT

3.4.1 Statement of Problem

Increased loading of the San Juan River and its tributaries with soil salts and elemental contaminants from irrigation return flows, urban runoff, contaminated groundwater, mine waste runoff, brine salt discharges from oil and gas wells, and oil refinery wastes degrade water quality and may be contributing to the decline of Colorado squawfish and razorback sucker as well as other native fish species in the San Juan River basin. Water quality studies in the San Juan River basin have previously focused on trace-element residues and organochlorine in fish and wildlife. Comparison of data from 1980 and 1984 with 1973 data on elemental residues in the Farmington area indicates residual levels of many elements not only are elevated but may be gradually increasing. Data on the toxic effects of selected chemicals on endangered fish species are being collected and evaluated. However, the results of these studies may have limited application for the San Juan River. The investigations to date have only considered the toxicity of waterborne concentrations of inorganic selenium and other elements to the Colorado squawfish, razorback sucker, and the bonytail chub. These studies have not addressed the effects of long-term exposure to selenium (organo-selenium) in the diet of these species and potential impacts to survival, growth, and reproduction of endangered fish species or other components of the aquatic environment. As survival of other native fish species as well as aquatic invertebrates is essential to survival of the endangered fish species, investigations on the effects of various contaminants upon all components of the aquatic communities of the San Juan River basin are critical.

Monitoring of existing water quality conditions in the San Juan River drainage is considered inadequate to provide the information upon which to base analysis of current land management practices (oil and gas development, agriculture, etc.) and flow regulation of the San Juan River and its tributaries, or to accurately predict environmental impacts from proposed development scenarios.

Little is known concerning the tolerance levels of Colorado squawfish and razorback sucker to potential contaminants in the San Juan River. Criteria presently available for use in analysis of project impacts have been based on conditions not present in the river and were developed using other fish species. The concentration of contaminants that may impact the endangered fish species should be quantified, while considering the synergistic relationships of the particular water quality conditions of the river (i.e., determination of criteria levels for selected contaminants singly and in conjunction with other contaminants). Since many of the contaminants are a part of the natural river system, elimination of these contaminants is not possible. Other contaminants derive completely or predominately from development activities and can be eliminated, or at least reduced to a level deemed unlikely to have chronic or acute effects upon members of

the aquatic community.

3.4.2 Course of Action

3.4.2.1 Research

- a. Historic water quality information on the San Juan River will be compiled, evaluated, and synthesized. Because of the potential to impact the contribution of the flows of the Animas River through development of the Animas-La Plata Project, particular emphasis will be given to the Animas River and other tributaries and their contributions to the water quality of the mainstem San Juan River.
- b. Types and sources of contaminants will be identified and characterized.
- c. Research will be initiated to determine and quantify the biological effects of various forms of selenium and other contaminants, such as polycyclic aromatic hydrocarbons (PAHs), on survival, growth, and reproduction of endangered fishes and other native fish species.
- d. Changes in water chemistry will be investigated and compared to the hydrologic cycle as well as to identify changes caused by inflows and discharges.
- e. A monitoring program will be instituted at a series of sites to systematically characterize the water quality of used and potential habitats of the endangered fish species in addition to sampling the problem areas. This program will also be used to evaluate the effectiveness of any recovery action initiated as a result of this research.

3.4.2.2 Recovery

- a. Numerous studies and monitoring programs have produced data on different aspects of water quality in the San Juan River basin. A data base, utilizing existing information, will be developed. This information will form the basis upon which to evaluate and characterize current conditions and to determine courses of action for remedying any identified problems. Expansion of environmental monitoring, in concert with specific investigations on both acute and chronic biological responses of the native community to contaminants, will be implemented to increase and improve the data base for consideration of water quality issues in recovery

decisions and actions.

- b. Implementation Program Participants will pursue actions necessary to bring about water quality improvements found necessary for recovery of the endangered fish species and conservation of other native fish species populations consistent with state and federal regulations.
- c. Measures will be taken to diminish or eliminate sources of contaminants that are identified as limiting recovery of endangered fish species populations.

3.5 INTERACTIONS BETWEEN NATIVE AND NON-NATIVE FISH SPECIES

3.5.1 Statement of Problem

The native fish fauna of the Colorado River drainage historically was comprised of 14 species, including six that are endemic to the system. Compared to the fish fauna of more mesic regions, that of the Colorado River is depauperate. Native Colorado River drainage fishes evolved in a system characterized by extreme seasonal fluctuations in flow regimes. Habitats ranged from small, headwater tributaries where coldwater-tolerant forms such as Colorado River cutthroat trout were abundant to large, turbulent, silt-laden rivers where especially adapted forms such as humpback chub and Colorado squawfish flourished. Other species such as speckled dace and flannelmouth sucker, more generalist in adaptations, were widespread and common in suitable habitats.

Modification of aquatic systems to satisfy human desires diminished availability and quality of habitats suitable for native fishes and, therefore, many species declined dramatically in distribution and abundance. Human-induced habitat modifications also created conditions conducive to establishment of non-native fish species. Since the late 1800's, at least 40 non-native fish species have been introduced intentionally or accidentally to the rivers and reservoirs of the Upper Colorado River Basin. The specific role of any single non-native species in the decline of a native fish species is difficult to assess, and several non-native species negatively interact with native species in multiple manners. Non-native fish species, such as red shiner and northern pike, compete with or prey upon native fishes, a few, such as rainbow trout, hybridize with and compete for resources with native fish species, and others, such as fathead minnow and plains killifish, have no discernable or demonstrated effect. Some non-native species occur infrequently or in such low numbers (e.g., green sunfish in the San Juan River) that their impact on native fishes is limited, if any. Several non-native fish species (red shiner and channel catfish) compete with or prey upon early life stages of native fishes and

subsequently they become prey for piscivorous native fishes. In a few instances, native predatory fish may utilize introduced forms (e.g., rainbow trout) when native prey are absent or greatly diminished in abundance.

In the San Juan River sub-basin, 23 non-native fish species have been reported. In comparison to other Upper Colorado River Basin drainages, the San Juan has few common or widely distributed non-native fish species. Of these, only common carp and channel catfish are common in main channel habitats within warmwater reaches and red shiner and fathead minnow are the most common non-natives in associated low-velocity habitats. Other non-native species in warmwater reaches are uncommon or occur sporadically. In main channel habitats, native fish species remain numerically dominant, but non-natives numerically dominate many low-velocity habitats.

Although the impact of non-native fishes upon the native fish fauna has been known for some time, and means to eliminate or reduce problem species are limited, expensive, and usually not feasible, the potential to conduct such actions in this Implementation Program will be evaluated. An essential element of any control effort is accurate definition of the problem. Among non-native fishes inhabiting the San Juan, the mode of interaction of particular non-native species with specific native species (or life stages of each) is not clearly defined. For example, adults of channel catfish consume a variety of food items, including fish. However, the relative impact of their foraging habits upon particular life stages of Colorado squawfish or other natives is not known. In low-velocity habitats, young of Colorado squawfish may compete for food and habitat with several non-natives. The effect of this presumed competition upon recruitment of young of Colorado squawfish to larger size-classes is unknown.

Although the San Juan River drainage is occupied by several warmwater non-native fish species, additional stocking of these species or introduction of new species will only exacerbate problems. In this sense, the best control is prevention of potential problems by eliminating stocking of non-native warmwater species.

The high flows of 1987 demonstrated an effective method of control of non-native species. That year, successful reproduction by channel catfish was markedly lower than in subsequent years when spring run-off was much lower and of shorter duration.

Other controls, such as chemical treatment, are biologically and logistically infeasible in almost all situations on the San Juan River. Some actions, while not strictly control, may be warranted in particular instances. Such actions might include

habitat modifications to the detriment of non-native fishes, and presumably the benefit of native species.

Stocking of most non-native fish species in the San Juan Drainage has been greatly curtailed in recent years; neither New Mexico nor Utah has stocked non-native warmwater species in the San Juan River in recent years. All non-native fish stocking in New Mexico and Colorado is limited to salmonids in upstream, coldwater reaches. Illegal stocking and bait minnow releases remain potential problems.

3.5.2 Course of Action

3.5.2.1 Research

- a. Characterize distribution and abundance of each non-native species.
- b. Identify and characterize habitats used by each life stage of common and "problem" non-native fish species.
- c. Identify non-native species which may or do interact with native fish species, develop research protocols to define the nature and extent of interactions between and among native and non-native fish species, and describe modes of interaction among subject species.
- d. Characterize response of populations of non-native fish species to various flow regimes and modification of habitats.
- e. Characterize significance of autochthonous production in tailwater reach to downstream habitat areas.
- f. Monitor and evaluate any efforts undertaken to diminish or eliminate "problem" non-native fish species.

3.5.2.2 Recovery

- a. Secure agreement among responsible resource agencies (state, federal, and tribal) to discontinue stocking of warmwater fish species in known, likely, or potential habitats of endangered fish species in the San Juan River.
- b. Limit stocking of non-native fish species to salmonids and restrict stocking to those habitats where endangered species do not or are not likely to occur and that are not important to the recovery of the endangered species.

- c. Institute regulations by appropriate state, federal, and tribal agencies to ban bait-minnow seining in habitats known or believed to support endangered fish species.
- d. Institute regulations by appropriate state, federal, and tribal agencies to ban import of extra-basin bait minnows to the San Juan River basin.
- e. Recommend and implement actions or management strategies, including flow manipulation or piscicide application, to reduce or eliminate negative impacts of non-native species upon native fishes.
- f. Implement efforts to disseminate information to the public to improve compliance with laws and regulations regarding introduction of non-natives and endangered species recovery.
- g. Implement a rigorous law enforcement program to minimize violations of laws and regulations regarding introduction of non-natives and endangered species.

3.6 MONITORING AND DATA MANAGEMENT

3.6.1 Statement of Problem

Monitoring is needed to evaluate status and trends of endangered fish species and other native and non-native species populations, and to define the overall success of this Implementation Program, not the least of which is the determination of viability of conservation efforts and the results of hypothesis testing. A data management system is therefore required to provide a repository for data obtained during and after the research period and serve as a central clearinghouse for dissemination of such data.

Federal, state, tribal, and private entities have collected extensive data on the life history, behavior, and habitat requirements of endangered fish species in the Upper Colorado Basin. The status and quality of these data are variable, and improved management and analysis of these data are priority management needs. A centralized data management system has been established for the Upper Basin to make the best possible use of existing data and ensure a coordinated and effective data management and analysis effort in the future. Such a system is key to conducting cost-effective research and monitoring programs in the San Juan River basin.

3.6.2 Course of Action

3.6.2.1 Research

- a. During the research period, monitoring will be accomplished by regularly scheduled and systematic inventories.
- b. Standardized methods will be used by all groups so that spatial and temporal trends can be identified and compared.
- c. The San Juan River data management will be compatible with that of the upper Colorado River Recovery Implementation Program.

3.6.2.2 Recovery

In order to facilitate the storage and provision of data for research, consultation, and recovery activities, the Service (Region 2) will

- a. Assume data management responsibilities for this Implementation Program.
- b. Coordinate monitoring responsibilities with the federal agencies, states, and tribes.
- c. Define a process for periodic review of monitoring and data management activities.
- d. Ensure that all data management activities are compatible with those of Region 6 and all data are available for use by that Region.

4.0 COMPLIANCE WITH THE ENDANGERED SPECIES ACT

4.1 REQUIREMENTS OF COMPLIANCE

Section 7 (a) (1) of the Endangered Species Act directs all federal agencies to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of endangered and threatened species. The terms "conserve," "conserving," and "conservation" are defined in the Act as to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary.

Section 7 (a) (2) of the Act further requires that all federal agencies consult/confer with the U.S. Fish and Wildlife Service regarding species protected under the Act. Consultation is necessary to ensure actions authorized, funded, or carried out by such agencies are not likely to jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat. The Endangered Species Act states that each federal agency will confer with the Service "on any action which is likely to jeopardize the continued existence of any species proposed to be listed . . . or result in the destruction or adverse modification of critical habitat proposed to be designated for such species."

Formal section 7 consultation is required for any federal action that "may affect" listed species or result in destruction or adverse modification of critical habitat. A conference is required if a federal action is likely to jeopardize the continued existence of any species proposed for listing as threatened or endangered, or result in the adverse modification of proposed critical habitat. The procedures and agency responsibilities under section 7 consultation must be followed for such federal actions in the Basin, including actions under this Implementation Program.

In rendering biological opinions on federal actions resulting in minor depletions, the Service will consider all new information concerning project impacts and the status of the listed species, and good faith implementation of this Implementation Program in determining if sufficient progress toward recovery has been made to offset depletion impacts, or any other project-induced impacts, on listed fish. It is understood that the aggregate of all minor depletions subject to section 7 consultation during the 7-year research period may result in a total annual depletion of not more than 3,000 acre-feet under the conditions of this paragraph.

Changes in circumstances regarding project design or species status may also prompt reinitiation of consultation for federal projects that have previously undergone section 7 consultation and where there is still federal control or involvement. Specifically, 50 CFR 402.16 requires reinitiation of formal consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in a biological opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species not considered in the biological opinion issued for the action; or (4) a new species is listed or critical habitat designated that may be affected by the action.

As stated in the MOU (Appendix A), "It is anticipated that Section 7 consultations will be initiated for all existing federal actions within the baseline for the ALP that are subject to consultation. The Service concluded that the reasonable and prudent alternative will offset 57,100 acre-feet of depletion for the ALP in addition to the depletions in the baseline. The operation of Navajo Dam to benefit the listed fish will be taken into account by the Service in its biological opinions on the depletion impact of these existing federal actions."

When requested, the Service will consult with a federal agency which is not a Participant in this Implementation Program. During such consultations, the Service will not consider any reasonable and prudent alternative which is based on progress as a result of this Implementation Program, without discussions with the Coordination Committee.

4.2 PROCESS OF COMPLIANCE

4.2.1 Sufficient Progress

During and after the 7 year research period (as described in the ALP biological opinion) on the San Juan River and its tributaries, significant new information will be available on the listed fish. Also certain recovery actions will have been implemented to benefit the listed fish. Such information and actions will constitute progress under the Implementation Program and will be considered by the Service in determining whether progress has been sufficient to offset impacts of future federal actions which are likely to jeopardize the listed fish.

The Service will determine if sufficient progress has been made under this Implementation Program based on the best available biological data and professional judgement. The Service will assess progress toward recovery in proportion to the potential jeopardy impacts of a proposed federal action. That is, the

smaller the impact of a federal action, the lower the level of progress needed to offset the impacts. If progress under this Implementation Program has not been sufficient, actions will be required from the federal agency or project sponsors to offset impacts of the federal action which are likely to jeopardize the endangered fish species.

The following are some examples of actions that will constitute progress toward recovery because they are expected to lead to a positive biological response of the endangered fish species (including, but not limited to, increased abundance, improved health, improved or increased survival) or improvement of their habitat (including, but not limited to, the availability, extent, or quality of those habitats). However, the actions, in and of themselves, may or may not constitute progress sufficient to offset potential jeopardy impacts to the endangered fish species from the proposed federal action which is under section 7 consultation.

- Modification of federal projects to maintain the level of depletions in the section 7 environmental baseline as described in the biological opinion for the ALP (baseline)

- Modifications to existing and proposed federal actions (i.e., measures) to lessen impacts to listed fish

- Acquisition of water for the benefit of listed fish

- Legal protection of water, including protection of reservoir storage releases, for the benefit of the listed fish to and through their habitat

- Operation or modification of federal projects to benefit listed fish

- Improvements to water quality in habitat areas used by listed fish

- Indications that listed fish populations or habitats are improving

- Support and participation by the parties in developing and carrying out the Implementation Program (including adequate funding)

- Identification of flow needs for the listed fish

- Physical habitat enhancement (e.g., removal of barriers, construction of fish passage facilities, improvement of spawning and nursery habitats, etc.)

- Control of exotic species

Augmentation of listed fish populations if determined to be biologically necessary

Research and studies carried out in accordance with the Implementation Program

This list is not meant to be all-inclusive; nor is it meant to exclude any action from consideration. It is provided merely as a list of examples. The first two examples listed may be initiated affirmatively to benefit endangered fish species, or may be implemented as project amendments to avoid jeopardy (Section 4.2.2).

At this time, the operation of Navajo Reservoir to mimic the natural hydrograph; the identification of the flow needs of the endangered fish; legal protection of reservoir storage releases to and through the occupied habitat; indication that endangered fish populations or their habitats are improving; and water quality improvement are viewed as the most important elements of achieving sufficient progress under this Implementation Program.

If the Service finds, in the course of a section 7 consultation, that progress under the Implementation Program is not sufficient to offset potential jeopardy impacts of a proposed federal action, it shall discuss (a) the basis for its finding with the federal agency and any applicant and (b) the availability of reasonable and prudent alternatives that the agency and the applicant can take to avoid a violation of section 7(a)(2) of the Endangered Species Act.

4.2.2 Actions to Avoid Jeopardy

As a result of research being conducted, it is anticipated that significant new information will be available on the endangered fish species. Also, certain recovery actions will have been implemented to benefit the endangered fish species. There is the option of a federal agency or project sponsor to implement actions in addition to those accomplished under this Implementation Program and which may also eliminate the likelihood of jeopardy caused by a proposed federal action. These measures would be reviewed by the Service in the consultation process for a proposed federal action even if sufficient progress has not been made under this Implementation Program. Two primary examples of such actions are listed below:

Modification of federal projects to maintain the level of depletions in the section 7 environmental baseline as described in the Biological Opinion issued for the ALP (baseline).

Modifications to existing and proposed federal actions

(i.e., measures) to lessen impacts to endangered fish.

4.2.3 Monitoring of Accomplishment of Reasonable and Prudent Alternatives

As discussed in Section 4.1, if a federal agency determines that an action it authorizes, funds, or carries out "may affect" a listed species or adversely modify or destroy critical habitat, it is required to initiate formal section 7 consultation with the Service. If the Service finds that the effect to the species is of such significance as to be likely to jeopardize the continued existence of the species, or result in destruction or adverse modification of critical habitat, a "jeopardy" or "adverse modification" biological opinion is issued at the conclusion of the consultation. That opinion will include, if possible, reasonable and prudent alternatives to the action which would be designed to remove jeopardy or adverse modification. Following the issuance and acceptance of a biological opinion containing reasonable and prudent alternatives, the steps taken in satisfaction of the requirements of such alternatives will be monitored and incorporated into the review of progress in the recovery of the species for future consultations.

4.3 TRUST RESPONSIBILITIES IN CONNECTION WITH SECTION 7 CONSULTATIONS

Due to competition for limited water resources in the San Juan River Basin, whenever a request is made for section 7 consultation, the Department of the Interior will use its authority to the fullest extent possible so that actions are not taken by federal agencies requesting such consultation in derogation of the water rights and related rights of the Tribes signatory to the Cooperative Agreement.

5.0 PROCEDURES AND ORGANIZATION

5.1 COMMITTEES

The Coordination, Biology, and Navajo Dam Operating Committees will be established pursuant to Sections 2 and 4 of the Endangered Species Act, as well as other applicable laws to carry out this Implementation Program.

5.1.1 Coordination Committee

The Participants in this Implementation Program shall each be entitled to voting membership on the Coordination Committee. The purpose of the Coordination Committee is to assure that the goals of this Implementation Program are achieved in a timely manner. To effect this coordination responsibility, the following entities will have the right to have one representative on the Coordination Committee (multiple representatives of a single agency will share the single vote allotted to each agency):

- Bureau of Reclamation
- Bureau of Indian Affairs
- Fish and Wildlife Service (Region 2)
- Fish and Wildlife Service (Region 6)
- Ute Mountain Ute Indian Tribe
- Southern Ute Indian Tribe
- Jicarilla Apache Indian Tribe
- Navajo Nation
- State of New Mexico
- State of Colorado
- State of Utah
- Water Development Interests
- Conservationists

Respectively, one representative from each of the latter two groups, the water development interests as a collective group and the conservationists as a collective group, shall be selected by those groups to serve on the Coordination Committee. Water development interests in Colorado, Utah, and New Mexico, shall have one representative and conservation organizations with offices in Colorado, Utah, or New Mexico shall have one representative.

Should a federal agency not listed above wish to participate in this Implementation Program in compliance with the requirements of section 7(a)(1) of the Endangered Species Act, it may submit its request for such participation to the Coordination Committee for approval. Such approval will be based on the satisfaction by the federal agency of the following criteria:

1. Legal and regulatory responsibilities to protect listed species or designated critical habitat; and
2. Permitting or regulatory authority affecting either the endangered fish species or their habitat; and
3. Commitment to provide sufficient funding to significantly contribute to the activities identified in the Long Range Implementation Plan and comply with the agency's section 7(a)(1) responsibilities.

Approval of new federal entities participating under section 7(a)(1) will be by a two-thirds majority vote of the Coordination Committee. Other federal agencies may be required to participate in this Implementation Program in compliance with section 7(a)(2) consultation requirements if such participation is determined by the Service to be necessary for removal of jeopardy for the specific action and is crucial for successful accomplishment of the goals of this Implementation Program. Such determinations will be made following discussions with the Coordination Committee. Participation by federal agencies under those circumstances will not be subject to approval by the Coordination Committee.

The Service, Region 2 Regional Director, or his designate, shall chair the Coordination Committee. The Committee shall function by two-thirds majority vote of the committee membership on all issues (including those sent to it by the Biology Committee for resolution), with unresolved issues referred to the Signatories of the Cooperative Agreement for resolution.

The Biology Committee shall submit an annual work plan, based on the Long Range Implementation Plan, and report of progress to the Coordination Committee for review and approval. If there are portions of the annual work plan or report that need clarification, the documents shall be returned to the Biology Committee for clarification prior to March 15 before final approval and distribution beyond the Coordination Committee.

The Biology Committee shall also prepare an annual budget to carry out work under this Implementation Program and submit it to the Coordination Committee for review and approval. If the budget cannot be funded at the requested level, the Biology Committee will revise the work plan to fit the available funding and re-submit the plan for distribution.

Recommendations from the Biology Committee on feasible and necessary recovery activities beyond the scope of the annual work plan will be provided to the Coordination Committee for approval and implementation.

Under this program, all Participants will work cooperatively to ensure the successful implementation of the recovery actions. If, however, any Signatory is unable to support this Implementation Program or components of it, or finds the recommendations of the Coordination Committee not justified, it will report its position to the Coordination Committee in writing. The Coordination Committee will be given sufficient time to resolve any problems. If issues cannot be resolved at the Coordination Committee level, those issues will be referred to the Signatories to the Cooperative Agreement for resolution.

Although the Secretary of the Interior, through the Service, is responsible for administering the Endangered Species Act, each federal agency is bound by the requirements of the Act. Additionally, as evident by the execution of the MOU and this Implementation Program, each federal, state, and tribal signatory is committed to the recovery of the endangered fish species of the San Juan Basin. In order to provide the organizational focus to facilitate the cooperative efforts to achieve that recovery, the Service will direct its efforts to assuring the full and cooperative consideration of all agency views, responsibilities, and constraints in the analysis of project impacts and recovery potential.

5.1.2 Biology Committee

The purpose of the Biology Committee is to assure that the goals of this Implementation Program are met by: (1) assessing the biological needs of the endangered fish species and identifying research needs in support of recovery elements; (2) conducting and coordinating research activities; (3) evaluating and updating recovery elements and research plans based on results of research; (4) identifying and evaluating potential recovery actions; (5) recommending feasible and necessary recovery actions for implementation by the Participants; (6) assessing progress under the program; and (7) providing progress reports and prioritized budget requirements to the Coordination Committee for review and approval.

Since the efforts of the Biology Committee relate specifically to the scientific basis for recovery, each participant on the committee shall have expertise on the San Juan River or its native fish fauna. Each of the following entities or groups may have one representative who meets the above requirements on the committee (multiple representatives of a single agency will share the single vote allotted to each agency):

Bureau of Reclamation
Bureau of Indian Affairs
Fish and Wildlife Service (Region 2)
Fish and Wildlife Service (Region 6)

Ute Mountain Ute Indian Tribe
Southern Ute Indian Tribe
Jicarilla Apache Indian Tribe
Navajo Nation
State of New Mexico
State of Colorado
State of Utah
Water Development Interests
Conservationists

The current members of the Ad Hoc Research Group, representing the Bureau of Reclamation, Bureau of Indian Affairs, Fish and Wildlife Service (Region 2), Fish and Wildlife Service (Region 6), Southern Ute Indian Tribe, and states of New Mexico, Colorado, and Utah are recognized experts on the San Juan River or its native fish fauna. These representatives are currently conducting the investigations of the ALP Seven-year Research Plan, meet the conditions for membership set forth, and will form the initial membership of the Biology Committee of this Implementation Program. Representation on the Biology Committee by entities not currently represented on the Ad Hoc Research Group, and additional federal entities participating in this Implementation Program through sections 7(a)(1) or 7(a)(2) of the Endangered Species Act, or replacement representation, will be through the following process:

1. The name and qualifications (expertise on the San Juan River or its native fish fauna) of the nominated representative to be added, accepted, or substituted, will be provided to the Program Coordinator.
2. The Program Coordinator will provide the material to the members of the Biology Committee. Such distribution will be either at the meeting of the Biology Committee or, if more expeditious, through contact with individual members of the Biology Committee.
3. The Biology Committee members will, within 30 days, review the qualifications of the nominee and forward their decision to the Program Coordinator.
4. The decision to reject any nominee to the Biology Committee must be supported by a two-thirds majority.
5. If the nominee is approved, the Program Coordinator will notify the nominating agency.
6. If the nominee is not approved, the Program Coordinator will so notify the nominating agency with accompanying reasons.

7. Under the circumstances of Item 6, the nominating agency may either submit another nominee or appeal the decision to the Coordinating Committee. The Coordinating Committee shall decide on such an appeal within 30 days.

Expertise (e.g., aquatic toxicology or other disciplines), if not available among the agency and tribal representatives, will be solicited as needed. The Biology Committee members will select their chairperson; votes will be carried by a two-thirds majority.

The representatives on the Biology Committee will be charged with bringing to this Implementation Program a cooperative and objective analysis of the river's habitats and fish community. The Biology committee will function by a two-thirds majority vote of the committee membership. Divergent views will be resolved at the Committee level whenever practicable. If resolution cannot be achieved (two thirds majority vote), a report of the question under dispute, including the dissenting views, will be provided to the Coordination Committee.

The Biology Committee will meet as often as needed; all meetings will be open to the public. A meeting will be scheduled on or about January 31 of each year to review the work accomplished in the previous fiscal year, to address in detail the annual work plan for the current fiscal year, and develop the annual work plan (based upon the Long Range Implementation Plan) for the succeeding fiscal year. A brief report by the principal investigator for each research effort, summarizing accomplishments and problems of research activities for the previous year, and a statement of required research and justification for the upcoming year will be submitted to the Program Coordinator by February 15. The Program Coordinator will compile such reports for transmittal to the involved agencies and Coordination Committee. The Bureau of Reclamation will also hold a meeting with the Biology Committee and the State water regulating agencies prior to March to recommend flow releases from Navajo Dam for the upcoming season. Submittal of the reports, and review and feedback, will be conducted in an expeditious manner in order to avoid delays in implementation of the research effort. The completion of review and provision of comments will be accomplished no later than March 31.

5.1.3 Navajo Dam Operating Committee

The section 7 consultation on ALP added an operation requirement to Navajo Dam to time releases from the dam to benefit the endangered fish species. In addition, a number of release patterns will be tested during the research period to aid in determination of the release patterns that are beneficial to the

endangered fish species. Close coordination between the Service, Bureau of Reclamation, Bureau of Indian Affairs, Navajo Nation, and the States of New Mexico, Colorado, and Utah is required to assure that impacts to users of water stored in Navajo Reservoir and those located downstream of the dam are considered and minimized in the determination of release patterns from Navajo Reservoir. Presently, diversion requirements of senior water rights holders must be met before storage releases can be made for the benefit of the endangered fish species. To facilitate coordination, a Navajo Dam Operating Committee is required.

The Navajo Dam Operating Committee shall advise the Biology Committee on available water to meet the needed flows for the research effort during any particular year. Membership shall consist of one representative of each of the following entities (multiple representatives of a single agency will share the single vote allotted to each agency):

Fish and Wildlife Service

Bureau of Reclamation - Navajo Dam Operations
 Bureau of Reclamation - Salt Lake Regional Office
 Bureau of Indian Affairs - NIIP Project Office
 Bureau of Indian Affairs - Albuquerque Area Office
 State of New Mexico
 State of Colorado
 State of Utah
 Navajo Nation

The representative from Bureau of Reclamation - Navajo Dam Operations, shall meet with the Biology Committee in January to present information on the projected water availability for the upcoming year (1 April-30 November) and storage capacity of Navajo Reservoir. The Biology Committee shall develop the desired criteria for releases for the coming year (April through November). The Navajo Dam Operating Committee shall meet sometime before March 10 of each year to analyze this input and determine if the release conditions can be met, considering senior water rights and water supply. Any other considerations that should be addressed should be compiled at this time and a report prepared for the Biology Committee. The report will be presented to the Biology Committee in March by a representative of the Operating Committee in time to finalize release rules for the coming year.

Disputes among representatives that cannot be resolved at the Biology Committee level shall be referred to the Coordination Committee per the conditions of Section 5.1.2.

5.2 SERVICE RESPONSIBILITY

The Service will be responsible for directing and coordinating

the overall Implementation Program. These responsibilities include:

1. Providing liaison and coordinating the activities of the Biology and Coordination Committees.
2. Ensuring that a long range plan, annual work plans, annual progress reports, and specific recovery goals for the San Juan River are prepared by the Biology Committee.
3. Seeing that the approved recovery activities are implemented.
4. Evaluating program/project accomplishments and shortcomings.
5. Disseminating information to involved state, federal, and tribal agencies.
6. Ensuring that appropriate federal scientific collecting permits are provided to each principal investigator and coordinating acquisition of scientific collecting permits from other responsible entities.
7. Advising Participants of requests for initiation of consultation.

The Service will be responsible for coordinating activities with the Upper Basin Recovery Implementation Program and the Colorado River Fishes Recovery Team.

To accomplish these responsibilities, the Service will appoint a Program Coordinator for this Implementation Program. The Program Coordinator will be responsible for overall program coordination and dissemination of information about program activities.

5.3 PROCEDURES AND APPROVALS

Successful completion of this Implementation Program will follow the general process outlined below and in Table 5.1.

5.3.1 Long Range Implementation Plan

The Program Coordinator will assist the Biology Committee in the development of a long range plan with research and recovery elements and goals. The draft long range plan will be provided within 12 months, with a final submitted by the Biology Committee and the Program Coordinator no later than January 1995. The plan will establish the milestones to be utilized in analyzing progress of this Implementation Program. The research plan developed as a part of the section 7 consultations for the ALP

and NIIP will be used as a basis for the overall research plan to assure that the conditions of the consultations are met.

The Long Range Implementation Plan will indicate the logical progression and priority of implementing identified recovery actions (Section 3.0) which are expected to result in recovery and delisting of the Colorado squawfish and razorback sucker. As such steps are completed, they constitute the milestones marking progress in achieving the goal of recovery of the endangered fish species. So long as the milestones established in the Long Range Implementation Plan are met, it is the mutual expectation of the Participants that this Recovery Implementation Program will serve as the foundation for a reasonable and prudent alternative for section 7 consultations, but shall not preclude the development of reasonable and prudent alternatives independent of the Implementation Program.

The Program Coordinator will forward plans and recommendations to the Coordination Committee for review and approval. Approval will be based on whether the Long Range Implementation Plan accurately reflects the best scientific information available, the efficient implementation of recovery goals, and the effective implementation of Sections 3 and 6 of this Implementation Program.

Table 5.1 Time Line and Approval Procedures

<u>When</u>	<u>Who</u>	<u>Product</u>
January	Biology Committee	Reviews AWP from Preceding FY; Prepares Detailed AWP development Current FY; Develops AWP Succeeding FY
	Biology and Navajo Dam Operating Committees	Preliminary flow regimes
February	Biology to Coordination Committee	Summary of PFY AWP Report
March	Coordination to Biology	Response to Summary Report
	Biology and Navajo Dam Operating Committees	Final flows Determined
March/April	Biology Committee	Typically initiation of field activities
April 1	Bureau of Reclamation	Initiate annual habitat flow releases from Navajo Dam
May, June, July, August, September	Biology Committee	Field Work
August/September	Biology Committee	Finalize AWP, Succeeding FY Forward to Coordination Committee
September	Coordination Committee	Response to Biology Committee on AWP, Succeeding FY

5.3.2 Annual Work Plan

The Program Coordinator will work with the Biology Committee to identify and expedite individual projects that are needed to accomplish the long range plan for each of the recovery elements.

The Program Coordinator and Biology Committee will draft an annual work plan consisting of high priority individual projects. The annual program will be formulated within the available funding for that year.

The Program Coordinator will forward the work plan to the Coordination Committee for review and approval. Approval of each annual work plan will be based on its consistency and compliance with the Long Range Implementation Plan and whether the planned annual scope of work can be accomplished with available funds. Approval shall be by two-thirds majority vote. Any needed clarification or modification will be completed by the Biology Committee prior to distribution to participating parties.

The annual work plan will be implemented by agency or tribal personnel, or by private contractors as staffing and funding allow.

5.3.3 Identification and Implementation of Recovery Actions

Following the identification and analysis by the Biology Committee of potential actions which may facilitate recovery of the endangered fish species of the San Juan River, such actions, including recommendations, if any, for capital expenditures, will be forwarded to the Coordination Committee for review and approval. The Coordination Committee will review and approve expenditure of capital funds based on the consistency of funding requests with Section 3 of the Recovery Implementation Program and the Long Range Implementation Plan.

Commitment to proceed with a specific action for recovery may be made by the Participants either through independent implementation of agreed upon steps by an individual entity, or by cooperative support of more complex recovery actions by any or all Participants.

5.4 PROGRAM MODIFICATIONS

Modifications to this Implementation Program may be recommended by any of the Participants and shall become effective upon written concurrence by at least a two-thirds majority of all Participants. The Participants recognize that the Service and federal agencies must re-initiate consultation when the circumstances described in 50 CFR 402.16 occur.

6.0 FUNDING OF THE IMPLEMENTATION PROGRAM

6.1 INTRODUCTION

One of the basic principles of this Implementation Program is that protection and recovery of the endangered fish species is a cooperative responsibility. This specifically applies to funding of the recovery program. The estimated expenditures for the recovery program are divided into two areas, the funds necessary to carry out and support research, and the monies required to implement recovery actions based on the research. The latter category must depend upon the results of the research and is, therefore, not discussed herein.

6.2 ANNUAL IMPLEMENTATION PROGRAM BUDGET

The elements described in this document are considered necessary for the protection and recovery of the endangered fish species. To date, funding of the research program has been provided by the Bureaus of Reclamation and Indian Affairs, in addition to in-kind funding by the state resource agencies of Colorado, Utah, and New Mexico, and Regions 2 and 6 of the Service. The availability of funding from governmental sources is subject to the authorization and appropriation by the federal and state legislative and tribal governmental bodies. Nothing herein shall be construed as obligating the Department of the Interior or any other participant to expend money or as involving the United States in any contract or other obligation for payment of money in excess of appropriations authorized by law. The annual budget suggested to fund the recovery elements described in this document totals \$1,980,000. The estimated distribution of this annual budget is presented in Table 6-1. The actual distribution of this annual budget will be developed as a part of the Long Range Implementation Plan and updated annually as a part of the Annual Work Plan.

Table 6.1 Estimated Annual Costs of Implementation Program

RECOVERY PROGRAM ELEMENT AND

RESEARCH PROGRAM COSTS

3.1 Essential Research for Long-Range Research Plan and Recovery Program Goal Development

Course of Action

3.1.1	Research	
	Distribution and Abundance	275,000.00
	Reproduction and Recruitment	125,000.00
3.1.2	Recovery	
	Long-range plan/recovery goal development	50,000.00

3.2 Protection of Genetic Integrity and Management and Augmentation of Populations

Course of Action

3.2.1	Research	
3.2.2	Genetics	25,000.00
	Augmentation	25,000.00
	Refugia	25,000.00

3.3 Protection, Management, and Augmentation of Habitats

Course of Action

3.3.1	Research	
	Habitat characterization and quantification	300,000.00
3.3.2	Recovery	
	Protection of flows	40,000.00
	Habitat development and maintenance	100,000.00

3.4 Water Quality Protection and Enhancement

Course of Action

3.4.1	Research	
	Baseline inventory and identification/quantification .	230,000.00
3.4.2	Recovery	
	Enhancement	50,000.00
	Protection	25,000.00

3.5 Species Interactions

Course of Action

3.5.1	Research	
	Identification and characterization of	

	non-native fish community	150,000.00
3.5.2	Recovery	
	Non-native fish management and control	30,000.00
3.6	Program Monitoring and Data Management	
	Course of Action	
3.6.1	Research	
	Monitoring and data management .	75,000.00
3.6.2	Recovery	75,000.00
3.7	Administration	
	Commitment per participant (\$20,000/	
	participant	180,000.00
	*Service	200,000.00
		<u>1,980,000.00</u>

Note: This budget reflects cost estimates during the initial phases of the RIP. Funding will shift from research to recovery activities as studies are completed and priority recovery activities identified and implemented.

6.3 ANNUAL FUNDING SOURCES

Funding reliability is critical to the success of this Implementation Program to ensure that the Program is conducted on a continuous basis, and that high-priority recovery elements are funded every year. Support for annual recovery activities will depend upon existing and new government sources. The availability of funding from governmental sources is subject to the authorization and appropriation by the federal and state legislative and tribal governmental bodies. Annual costs also reflect an estimated \$20,000 per Participant for administration, meeting attendance, etc. The following discussions of costs per Participants are estimates only and do not constitute an agreed upon final sum from any Participant.

The suggested funding amounts from the sources listed in 6.3.1 - 6.3.12 is \$1,820,000. With a suggested annual budget of \$1,980,000, there exists a \$160,000 annual shortfall. It is anticipated that other federal agencies will enter the Implementation Program through requirements of section 7(a)(1) or 7(a)(2) of the Endangered Species Act or other Participants may support unfunded elements of the Implementation Program, thereby eliminating the potential funding shortfall. Until such additional funds are available, recovery elements would be funded

at the reduced level.

6.3.1 U.S. Fish and Wildlife Service

The Fish and Wildlife Service will provide \$200,000 in cash and in-kind services to this Implementation Program. No funding is yet available to support the administration of this Implementation Program. However, the Service will seek funding in the amount of \$200,000 (Region 2 - \$150,000; Region 6 - \$50,000) for this activity. The Service will provide support staff and expenses for the Program Coordinator and senior biologist.

6.3.2 U.S. Bureau of Reclamation

The Upper Colorado Region of the Bureau of Reclamation has provided funds for studies to define habitat use and inventory endangered fish species in the San Juan River Basin. The Bureau of Reclamation has agreed to fund research activities associated with this Implementation Program as part of the ALP Section 7 Consultation for a seven-year period. Total annual costs to the Bureau of Reclamation, including in-kind services is \$670,000.

6.3.3 U.S. Bureau of Indian Affairs

The U.S. Bureau of Indian Affairs will coordinate Implementation Program activities involving the four tribes that are participating in this Implementation Program, including protection of storage releases for the benefit of endangered fish species by the four tribes involved. In fulfillment of requirements under the NIIP section 7 consultation, the Bureau of Indian Affairs has provided \$120,000 per year plus a commitment to conduct the habitat/flow relationship research and modeling and operational modeling of the San Juan River. In addition, the Bureau of Indian Affairs will participate in the Coordination, Biology, and Operating Committees. The estimated contribution by the Bureau of Indian Affairs is \$175,000 direct funding plus \$400,000 in-kind services, including the commitment to continue the habitat/flow studies presently ongoing until completed.

6.3.4 State of New Mexico

The State of New Mexico will participate in the Coordination, Biology, and Navajo Dam Operating Committees, and the estimated annual cost of this contribution including in-kind services is \$80,000. The State of New Mexico has agreed to protect reservoir releases for the benefit of the endangered fish species. Protection of water released for the benefit of the endangered

fish species may be accomplished by the State Engineer without creating a watermaster district. If so, New Mexico's contribution for this activity would be about \$5000 annually, plus some capital costs. If a watermaster district is established to administer water in the San Juan River Basin in New Mexico, the watermaster can assume this responsibility and some capital cost also may be required.

6.3.5 State of Colorado

The State of Colorado will participate in the Coordination, Biology, and Navajo Dam Operating Committees, and the estimated cost of this contribution, including in-kind services, is \$50,000 per year.

6.3.6 State of Utah

The State of Utah has agreed to participate in the Coordination, Biology, and Navajo Dam Operating Committees, and to ensure administration of instream flows necessary to recover endangered fish species in the San Juan River in Utah. The estimated cost of this in-kind contribution is \$50,000 per year, including instream flows administration.

6.3.7 Southern Ute Indian Tribe

The Southern Ute Indian Tribe has agreed to participate in the Coordination and Biology Committees. In addition, the tribe has agreed to participate in all Implementation Program activities. A total estimated cost, including in-kind contributions, is \$25,000 per year for the Southern Ute Indian Tribe.

6.3.8 Ute Mountain Ute Indian Tribe

The Ute Mountain Ute Indian Tribe has agreed to participate in the Coordination and Biology Committees. In addition, the tribe has agreed to participate in Implementation Program activities that involve tribal lands, or activities on tribal lands. A total estimated cost, including in-kind contributions, is \$25,000 per year for the Ute Mountain Ute Indian Tribe.

6.3.9 Jicarilla Apache Indian Tribe

The Jicarilla Apache Indian Tribe has agreed to participate in the Coordination and Biology Committees. In addition, the tribe has agreed to participate in Implementation Program activities that may, through the release and protection of flows in the San

Juan River, affect tribal lands, or activities on tribal lands. A total estimated cost, including in-kind contributions, is \$25,000 per year for the Jicarilla Apache Indian Tribe.

6.3.10 Navajo Nation

The Navajo Nation has agreed to participate in the Coordination, Biology and Navajo Dam Operating Committees, and to ensure administration of habitat flows for endangered fish species on lands of the Navajo Reservation. In addition, the Navajo Nation has agreed to participate in Implementation Program activities that involve tribal lands, or activities on tribal lands. A total estimated cost, including in-kind contributions, is \$40,000 per year for the Navajo Nation.

6.3.11 Water Development Interests

The water development interests may agree to participate on the Coordination and Biology Committees. The total estimated cost, including in-kind contributions, is \$40,000 per year.

6.3.12 Conservationists

The conservation community may agree to participate on the Coordination and Biology Committees. The total estimated cost, including in-kind contributions, is \$40,000 per year.

6.3.13 All Participants

Funding may be required for expanded research efforts to add to anticipated data requirements for ongoing or planned section 7 consultations, or for management or recovery actions identified during the progress of this Implementation Program.

Funding for delineated recovery actions identified during or after the 7-year research period may be provided by the Participants on an individual action basis, or in general support of the annual combined research effort. Funding levels will be requested in sufficient time to accommodate budgetary planning and execution by the Participants. Identified but unfunded recovery actions, if considered integral to the analysis of sufficient progress, may also be addressed in section 7 consultation activities for funding, if applicable.

6.4 CAPITAL FUNDS

In addition to the annual costs identified in Table 6-1, capital expenditures may be necessary for flow management (gates and

other equipment), fish passages, removal of barriers, construction, maintenance, and management of hatcheries and refuges, and possibly other, as yet unidentified, items. Estimated cost of capital expenditures for the Program is \$5 million. This estimate will be refined, and may be increased or decreased, depending on the success of various recovery activities in the San Juan Basin. It is anticipated that these funds will be appropriated from the federal Land and Water Conservation Fund, other existing federal funds, or other Participant funding mechanisms. Federal appropriations will require recommendation of the Department of the Interior and Congressional authorizations and appropriations. Non federal funds may also be used to support capital expenditures. All Participants agree to support efforts to provide capital funding for this Implementation Program as needs are identified by the Coordination Committee.

6.5 ADMINISTRATION OF RECOVERY FUNDS

All funds will be used in accordance with the priorities established in this Implementation Program under an annual work plan prepared by the Program Coordinator, in consultation with other Participants, and approved by the Coordination Committee. The Coordination Committee will review research activities and priorities and oversee spending and allocation of all Implementation Program funds. Annual funding will be available from each of the designated annual funding sources at the beginning of each federal fiscal year (October 1), unless otherwise agreed to. An annual accounting of funds allocated in the preceding fiscal year will be provided to the Coordination Committee at the beginning of each fiscal year, identifying funds to be earmarked by each funding source for Implementation Program activities for the upcoming year. When appropriated, capital funds will be disbursed by the Service, acting on the recommendations of the Coordination Committee.

Annual funds will be administered directly by the agencies (federal, state, etc) responsible for the funds, according to their individual administrative regulations and procedures. The Program Coordinator will be responsible for maintaining records showing distribution and expenditures of all annual and capital funds expended under the workplan by each funding source. An accounting of funds expended during the preceding year will be provided at the end of each fiscal year.

Wherever possible, funds accruing directly to this Implementation Program will be placed in interest-bearing accounts, such as those administered by the National Fish and Wildlife Foundation, until such time as they are utilized in accordance with the annual budget approved by the Coordination Committee. The Service will be responsible for administering and accounting for these Implementation Program funds. Interest accruing to these accounts will be used to support recovery activities.

6.6 ANNUAL BUDGET REVIEW

Funding of this Implementation Program until the endangered fish species are recovered and de-listed is essential. While it is recognized that the availability of funds from each source will be subject to legislative action, the respective Participants are responsible for obtaining their portion of the funds needed to achieve the purposes of this Implementation Program. The Coordination Committee will annually assess funding requirements and the contributions expected from all sources (including an accounting of in-kind services), and will recommend whether the net effect of any shortfall would make it impossible to effectively carry out this Implementation Program.

The Coordination Committee will annually review progress toward recovery, and will recommend adjustments to the operating budget to reflect changing needs and priorities. If the Coordination Committee determines that the financial estimates and contributions from all sources are not sufficient to carry out this Implementation Program, the Coordination Committee may recommend how and from what source additional revenues may be acquired.

II. COOPERATIVE AGREEMENT

COOPERATIVE AGREEMENT
for the
SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM

COOPERATIVE AGREEMENT

This Cooperative Agreement is entered into by the United States of America, represented by the Department of the Interior (Department); the State of Colorado; the State of Utah; the State of New Mexico; the Navajo Nation; the Southern Ute Indian Tribe; the Ute Mountain Ute Indian Tribe; and the Jicarilla Apache Indian Tribe.

I. PURPOSE

On October 24, 1991, a Memorandum of Understanding was executed by the Department, the States of Colorado, Utah, and New Mexico, the Ute Mountain Ute Indian Tribe, the Southern Ute Indian Tribe, and the Jicarilla Apache Indian Tribe, to set forth certain agreements and to establish the foundation for a long-term program to recover the endangered fish species of the San Juan River Basin. This Cooperative Agreement adopts the attached San Juan River Basin Recovery Implementation Program (Implementation Program). The signatories to this Cooperative Agreement agree to participate in and support the Implementation Program including the committees established by the Implementation Program.

II. AUTHORITIES AND RESPONSIBILITIES

- A. Federal Cooperation with States. Section 2(c)(2) of the Endangered Species Act, states that "the policy of Congress is that Federal agencies shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species." Under section 6 of the Act, the Secretary of the Interior is directed to cooperate to the maximum extent practicable with the States in carrying out the program authorized by the Act and to consult with affected States before acquiring any land and water, or interest therein, for the purpose of conserving endangered species. Under section 6 of the Act, an executive agency should enter a cooperative agreement when anything of value will be transferred to a State or local government to carry out a public purpose authorized by Federal statute.
- B. Recovery Plans and Teams. Under section 4(f) of the Endangered Species Act, the Secretary is directed to develop and implement plans for the conservation of endangered species and may procure the services of public and private agencies and institutions in developing and implementing such recovery plans.
- C. Consultation and Coordination Among Federal Agencies. Under section 7 of the Endangered Species Act, Federal agencies shall utilize their programs and authorities in furtherance of the purposes of the Act and ensure that their actions are not likely to jeopardize listed species. The Department has the authority to enter into this Cooperative Agreement under section 1 of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.). Under

section 2 of the Fish and Wildlife Coordination Act, Federal agencies must consult with the Fish and Wildlife Service and with State wildlife agencies on the fish and wildlife impacts of Federal or federally licensed or permitted water projects.

- D. Applicable State Law. Pursuant to the applicable State laws and interstate compacts, Colorado, Utah, and New Mexico administer water rights, including water for instream uses, and oversee development of water resources, allocated and apportioned to them in perpetuity by interstate compacts. Each of these States also has certain statutory authority and responsibility to protect and manage its fish and wildlife resources.
- E. Applicable Tribal Law. Pursuant to the applicable Tribal laws, and inherent Tribal sovereignty, the Navajo Nation, the Southern Ute Indian Tribe, the Ute Mountain Ute Indian Tribe, and the Jicarilla Apache Indian Tribe have the authority to administer water rights, to oversee the development of water resources, and to protect and manage fish and wildlife resources within the boundaries of their reservations.
- F. Statement of Authorities. The signatories hereby state that they have legal authority to enter into this Cooperative Agreement, and have legal authority to carry out all the provisions of the Implementation Program.

III. TERMS AND CONDITIONS

- A. Effective Date and Duration. This Cooperative Agreement shall be effective as of November 1, 1992, and shall remain in effect for a period of 15 years, however, the protection of the reservoir releases as per the Biological Opinion for the Animas-LaPlata Project (Project) shall survive the termination of this agreement and last for the life of the Project.
- B. Amendment. This Cooperative Agreement may be extended, amended, or terminated by agreement of the signatories, or any signatory may withdraw from this Cooperative Agreement upon written notice to the other signatories.
- C. No Delegation or Abrogation. All signatories to this Cooperative Agreement recognize that they each have statutory responsibilities that cannot be delegated, and that this Cooperative Agreement does not and is not intended to abrogate any of their statutory responsibilities.
- D. Consistency with Applicable Law. This Cooperative Agreement is subject to and is intended to be consistent with all applicable Federal, State, and Tribal laws and interstate compacts.

- E. Legislative Approval. All funding commitments made under the Implementation Program and this Cooperative Agreement are subject to approval by the appropriate State, Tribal, and Federal legislative bodies.
- F. Implementation Program Modifications. Modifications to the Implementation Program may be made pursuant to section 5.4 of the attached Implementation Program without requiring modification to this Cooperative Agreement or the additional written consent of the signatories to this agreement.

IN WITNESS WHEREOF each party has caused this Cooperative Agreement to be executed by an authorized official on the day and year set forth below by his or her signature.

UNITED STATES OF AMERICA

by Manuel Lujan Jr.
Manuel Lujan, Secretary of the Interior

Date October 28, 1992

STATE OF COLORADO

by _____
Roy Romer, Governor

Date _____

STATE OF NEW MEXICO

by _____
Bruce King, Governor

Date _____

STATE OF UTAH

by _____
Norman H. Bangerter, Governor

Date _____

NAVAJO NATION

by _____
Peterson Zah, President

Date _____

SOUTHERN UTE INDIAN TRIBE

by _____
Leonard Burch, Chairman

Date _____

UTE MOUNTAIN UTE INDIAN TRIBE

by _____
Judy Knight-Frank, Chairman

Date _____

JICARILLA APACHE INDIAN TRIBE

by _____
Leonard Atole, President

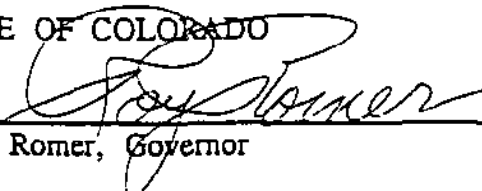
Date _____

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UNITED STATES OF AMERICA

by _____ Date _____
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by  _____ Date 10-30-92
Roy Romer, Governor

STATE OF NEW MEXICO

by _____ Date _____
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangerter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

SOUTHERN UTE INDIAN TRIBE

by _____ Date _____
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by _____ Date _____
Judy Knight-Frank, Chairman

JICARILLA APACHE INDIAN TRIBE

by _____ Date _____
Leonard Atole, President

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UNITED STATES OF AMERICA

by _____ Date _____
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by _____ Date _____
Roy Romer, Governor

STATE OF NEW MEXICO

by Bruce King Date 11/6/92
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangerter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

SOUTHERN UTE INDIAN TRIBE

by _____ Date _____
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by _____ Date _____
Judy Knight-Frank, Chairman

JICARILLA APACHE INDIAN TRIBE

by _____ Date _____
Leonard Atole, President

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UNITED STATES OF AMERICA

by _____ Date _____
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by _____ Date _____
Roy Romer, Governor

STATE OF NEW MEXICO

by _____ Date _____
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangerter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

SOUTHERN UTE INDIAN TRIBE

by Leonard Burch Date Nov 3, 1992
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by _____ Date _____
Judy Knight-Frank, Chairman

JICARILLA APACHE INDIAN TRIBE

by _____ Date _____
Leonard Atole, President

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UNITED STATES OF AMERICA

by Manuel Lujan Jr.
Manuel Lujan, Secretary of the Interior

Date October 28, 1992

STATE OF COLORADO

by _____
Ray Romer, Governor

Date _____

STATE OF NEW MEXICO

by _____
Bruce King, Governor

Date _____

STATE OF UTAH

by _____
Norman H. Bangert, Governor

Date _____

NAVAJO NATION

by _____
Peterson Zah, President

Date _____

SOUTHERN UTE INDIAN TRIBE

by _____
Leonard Burch, Chairman

Date _____

UTE MOUNTAIN UTE INDIAN TRIBE

by Judy Knight-Frank
Judy Knight-Frank, Chairman

Date _____

JICARILLA APACHE INDIAN TRIBE

by _____
Leonard Atola, President

Date _____

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UNITED STATES OF AMERICA

by _____ Date _____
Manuel Lujan, Secretary of the Interior

STATE OF COLORADO

by _____ Date _____
Roy Romer, Governor

STATE OF NEW MEXICO

by _____ Date _____
Bruce King, Governor

STATE OF UTAH

by _____ Date _____
Norman H. Bangerter, Governor

NAVAJO NATION

by _____ Date _____
Peterson Zah, President

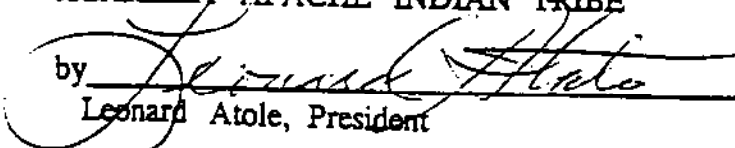
SOUTHERN UTE INDIAN TRIBE

by _____ Date _____
Leonard Burch, Chairman

UTE MOUNTAIN UTE INDIAN TRIBE

by _____ Date _____
Judy Knight-Frank, Chairman

HICARILLA APACHE INDIAN TRIBE

by  _____ Date 11-13-92
Leonard Atole, President

III. LONG RANGE PLAN

LONGRANGE IMPLEMENTATION PLAN
SAN JUAN RIVER RECOVERY IMPLEMENTATION PLAN

7 FEBRUARY 1995

PREPARED BY:

SAN JUAN RIVER RECOVERY IMPLEMENTATION PROGRAM
BIOLOGY COMMITTEE

1.0 INTRODUCTION

1.1 AUTHORITY

The San Juan Recovery Implementation Program has as its two major bases; 1) obligation of all federal agencies operating in the basin to fulfill the requirements of the Endangered Species Act and other statutes, and 2) the responsibilities and authorities of the states and tribal governments for the stewardship and management of natural resources of the Basin.

The San Juan Recovery Implementation Program (Program) became operational in October 1992, executed by the signing of a Cooperative Agreement by the Department of the Interior, the States of Colorado and New Mexico, and the Ute Mountain Ute, the Southern Ute, and the Jicarilla Apache tribes. The Program incorporated as its core the Reasonable and Prudent Alternative included in the Biological Opinion for the proposed Animas-LaPlata Project and the commitment of involved agencies to a Seven Year Research effort to document the response of the native fish community to flows released from Navajo Dam to mimic the natural hydrograph of the San Juan River. The Navajo Indian Irrigation Project Biological Opinion added to the requirements and incorporated specific information needs for that project into the overall investigative effort. Subsequently, a Biological Opinion was issued to the U.S. Bureau of Land Management regarding oil and gas development in the Basin. This Biological Opinion included participation of USBLM in the Seven Year Research Plan. Other entities may enter the Program as a result of Endangered Species Act Section 7 consultation or as provided in the San Juan River Recovery Implementation Program.

Section 5.3.1 of the San Juan River Recovery Implementation Program document sets forth the requirement of the Biology Committee to formulate a Long Range Implementation Plan (LRP) to establish milestones to be utilized in analyzing the progress of the Program.

1.2 PURPOSE

The purpose of the Long Range Plan is to provide the infrastructure necessary to guide and document the delineation and accomplishment of recovery steps to achieve the goals identified for the San Juan River Basin Recovery Implementation Program. This Long Range Plan provides milestones for marking progress in achieving the goal of recovery of the endangered fish species. As set forth in the Program document, the goals of the Program are two-fold:

1. To conserve populations of Colorado squawfish and razorback sucker in the Basin consistent with the recovery goals established under the Endangered Species Act, 16 U.S.C. 1531 et seq.
2. To proceed with water development in the Basin in compliance with

federal and state laws, interstate compacts, Supreme Court decrees, and federal trust responsibilities to the Southern Utes, Ute Mountain Utes, Jicarilla Apaches, and the Navajos.

The time frame for the achievement of the Program's goals is 15 years; hence, this Long Range Plan (LRP) is directed toward the realization of discernable and appreciable positive biological responses of the endangered fish species and their habitats to management of water and other resources in the Basin within that time frame. Recovery of the two endangered species (Colorado squawfish and razorback sucker) is not considered viable without fully understanding and managing the native fish community of which they are a component. Thus, this Long Range Plan addresses the aquatic components and terrestrial linkages to the aquatic system of the Basin that may affect the native fish community.

For the purposes of the San Juan River Long Range Plan, management of the native fish community is defined as those activities which are necessary to provide for the biotic and abiotic needs essential to the recovery of the endangered species.

Within the 15-year planning horizon encompassed by the Program, this Plan will provide for the formulation of annual work plans for the satisfaction of identified information needs, the timely evaluation of the success of actions implemented to protect and recover the endangered fish species of the Basin, and the short term, intermediate, and ultimate actions necessary to attain recovery and allow for compatible development of the Basin's resources. The integration and evaluation of research results and, as appropriate and possible, adaptive management actions, will occur annually to provide the foundation upon which planning, research, and recovery action initiatives can be tested. The Biology Committee shall report to the Coordination Committee annually as to these matters.

2.0. LONG RANGE PLAN

It is recognized that the Endangered Species Act imposes no legal requirement to protect the native fish community apart from the endangered fish, and that there is no legal requirement within this RIP to curtail water development on account of its impact on the native fish community apart from the endangered fish species. However, recovery of the endangered species requires understanding the functional relationships of the biotic and abiotic components of the San Juan River and how they influence its native fish community. Narrowly focusing on only the two endangered species will omit important components on which the recovery of those species may depend. Therefore, a broadly based fish community approach is essential to achieving the goals of the San Juan River Recovery Implementation Program. In addition, the relative achievement of these goals will be the criteria upon which success of the Program as a whole will be judged and evaluated.

2.1. BACKGROUND

The native fish community of the San Juan River evolved in a system characterized by dramatic physical environmental changes. Flow varied from almost non-existent to devastating floods. Seasonal and annual environmental changes wrought by widely different flows were not predictable, but over time such variations were certain to occur. Such extremes in abiotic conditions presented aquatic organisms with environmental conditions that changed frequently in availability, quality, and extent. Within the naturally variable system, species evolved strategies to utilize the differentially available habitats and avoid competition for such. The selective pressures of harsh environments contributed to low species richness and diversity of the San Juan River. Although few in number, most native fish species are long-lived. Different life stages (i.e., larva, juvenile, sub-adult, and adult) differentially utilize available resources and thus function as distinct ecological species. Despite a level of niche segregation, the ecological species are interdependent. A superficially simple system belies a complex one of many subtle biotic and abiotic interactions and dependencies.

The imperilment of the native fish community and extirpation of several native species were caused by a variety of human-induced biotic and abiotic modifications of the San Juan River ecosystem. Only four of the verified eight native fish species in the San Juan River system remain comparatively common in the drainage. Dams and diversion structures fragmented ranges, disrupted natural thermal and flow regimes, altered sediment transport dynamics, and diminished availability of seasonally required habitats; agriculture, industry, mineral extraction, and urban development diminished water quantity and quality; artificial channel structuring eliminated important habitats; establishment and encroachment of non-native riparian plant species reduced the naturally varying river channel; watershed management practices, exacerbated by natural climatic change, elevated sediment loading of the river; and introduction and establishment of over 20 non-native fish species and management of non-native sports fishes (including native fish eradication) imposed additional competitive and predaceous pressures. The strategies native fishes evolved to survive in a naturally variable and harsh environment ill-prepared them for persistence in an artificial and human-modified system.

Successful accomplishment of the Long Range Plan is dependent upon acquiring and utilizing information from a variety of disciplines. Considerable effort must be expended to characterize the biological attributes of individual fish species in the San Juan River, intra- and interspecific interactions, relation of various abiotic manipulations to the structure and dynamics of fish communities, and factors which may limit any species or native aquatic communities.

3.0. GOALS

The major focus of the LRP is recovery of the endangered fish species. The goals as presented below form the general structure of the community approach of which the endangered species are a part.

3.1. MAINTENANCE AND ENHANCEMENT OF THE NATIVE FISH COMMUNITY OF THE SAN JUAN RIVER.

The native fish community of the San Juan River basin was composed of at least eight species and perhaps ten. Among the verified native fishes, only speckled dace, flannelmouth sucker, and bluehead sucker remain comparatively common and widespread. Mottled sculpin is common in Colorado tributaries and in New Mexico is found mainly in the San Juan drainage above Farmington. Colorado cutthroat trout is eliminated from almost all areas of former occupancy. The range of roundtail chub is fragmented and it is generally rare where present. Colorado squawfish is found in low numbers only in mainstem habitats downstream of the Animas and San Juan confluence while razorback sucker is extremely rare and persists mainly as a few individuals that periodically enter the San Juan Arm of Lake Powell. If historically present, bonytail and humpback chub probably occurred mainly in the canyon-bound reaches of the lower San Juan River. Numerous human-induced modifications and manipulations of the aquatic habitats and introduction of non-native fishes have impacted all native fishes, including those that remain comparatively common.

The overall strategy of maintenance and enhancement of the native fish community must be accomplished to enable the achievement of the more specific goals of recovery and conservation of Colorado squawfish and razorback sucker. The successful accomplishment of this goal is dependent upon and will be assessed by the achievement of the following objectives. These general objectives provide the framework for development of interim management objectives and quantifiable recovery goals.

- 3.1.1. Mimickry of a natural hydrograph that reflects recent climatic (conditions to meet the biological and habitat needs of the fish while providing for human use of the water resources.
- 3.1.2. Management of extant native fish species and enhancement of depleted native species possible within the context of activities for endangered species.
- 3.1.3. Removal or remediation of factors which impede or preclude successful management of the native fish community.

3.2. RECOVERY AND CONSERVATION OF COLORADO SQUAWFISH IN THE SAN JUAN RIVER BASIN AS PART OF THE NATIVE FISH COMMUNITY.

3.2.1. REPRODUCTION

Spawning of sufficient frequency and magnitude must occur to produce adequate numbers of offspring for recruitment to the adult population. Conditions must be provided for annual reproduction. Reproduction will be documented by capture of young-of-year specimens.

3.2.2. RECRUITMENT

Regular recruitment of individuals to the reproductively active population is required for recovery and conservation.

3.2.3. RANGE AND ABUNDANCE

Range and abundance must be increased above current levels to secure occupation of designated critical habitat and other suitable areas.

3.2.4. RESTORE POPULATIONS

Improve habitat conditions to allow existing populations to respond to these habitat changes. If studies indicate remnant populations are too small or isolated to respond to habitat modifications then explore additional management options, including augmentation, to expand current wild populations.

3.3. RECOVERY AND CONSERVATION OF RAZORBACK SUCKER IN THE SAN JUAN RIVER AS A VIABLE PART OF THE NATIVE FISH COMMUNITY.

3.3.1. AVOID EXTIRPATION

Preclude further adverse modification of razorback sucker habitats and establish refugia.

3.3.2. RESTORE POPULATIONS

If studies indicate augmentation is feasible, stock razorback suckers of appropriate lineage to establish a viable population in San Juan River.

3.3.3. REPRODUCTION

Spawning of sufficient frequency and magnitude must occur to produce adequate numbers of offspring for recruitment to the adult population. Conditions must be provided for annual reproduction. Reproduction will be documented by capture of young-of-year specimens.

3.3.4. RECRUITMENT

Regular recruitment of individuals to the reproductively active population is required for recovery and conservation.

3.3.5. RANGE AND ABUNDANCE

Range and abundance must be increased above current levels to secure occupation of designated critical habitat and other suitable areas.

4.0. LONG RANGE PLAN OBJECTIVES

Achievement of the objectives of the Long Range Plan are dependent upon successful accomplishment of identified research and management activities. While the endangered fish species are the focus of these needs, the overall status and health of the entire native fish community must be the broader framework within which recovery and conservation is achieved. This section provides a description of these objectives and tasks, of both research and management orientation, required to attain recovery of the endangered fish species and management of the native fish community in the San Juan River basin. The sequence of objectives does not imply priority.

4.1. DEVELOP QUANTIFIABLE MEASURES OF ACHIEVEMENT OF RECOVERY OF NATIVE FISH COMMUNITY.

Assessment of the relative achievement of recovery and management objectives requires development of quantifiable measures of success (or failure). Relative measures to evaluate progress (Interim Management Objectives), using information obtained during the Seven Year Research effort, will be developed for Colorado squawfish, razorback sucker, and the native fish community. As new information is obtained these relative measures will be modified and quantifiable goals developed as necessary.

4.2. IDENTIFY, PROTECT, AND RESTORE HABITATS.

In order to determine full recovery potential of endangered fish species, qualification and quantification of the historic and present river channel conditions are necessary. Data on historic San Juan River channel conditions are available in varying and limited forms; however, sufficient data exist to allow limited comparisons with current channel conditions and dynamics. Initial tasks within this objective are to identify historic and current river channel conditions. This includes identification of geomorphically distinct river reaches and detailed habitat mapping of these reaches. Included within this characterization is a determination of overall changes from historic to current conditions. Research activities are designed to evaluate physical habitat changes, both qualitatively and quantitatively, as a response to different flow regimes. Activities are designed to address both unregulated flows and those that can be provided by releases from Navajo Dam. Modelling of flow and habitat relationships will be conducted to allow for a definition of expected river channel conditions that are likely to occur as a result of different flow regimes. Habitat use patterns by all life stages of endangered, other native, and non-native fish species will be determined and monitored to evaluate responses to different flow regimes. These data will be incorporated into flow recommendations. Results of native fish community habitat studies will be incorporated into management recommendations for the removal or modification of instream structures that impede native fish movements or limit range and creation or enhancement of required but unavailable or limited habitats. To identify and provide for flow regimes necessary to recover the endangered fish species and benefit the native fish community, an evaluation of the quality, quantity, and sources of water is required. While Navajo Reservoir has been identified as the primary origin, other sources, particularly the Animas River, will be investigated. Analyses of stream channel conditions provided by both reservoir-controlled flows and those occurring via inflow from tributary streams will be conducted. Included within the provision of flows necessary to recover the endangered fish species and manage the native fish community is the necessity to protect these flows. Means of protection will be attained through Tribal, State, and Federal regulatory actions.

4.3. IDENTIFY AND MANAGE THE NATIVE FISH COMMUNITY OF THE SAN JUAN RIVER BASIN TO RESTORE THE ENDANGERED FISH SPECIES

Protection and long-term management of the native fish community is best accomplished through an approach that emphasizes an evaluation of historic and current community structure dynamics. Specifically, identification of the spatial and temporal distribution and abundance patterns of the native fish species relative to man-caused alterations of the San Juan River is the focus of this objective. In concert with research activities on physical environmental changes, fish community data will provide necessary guidance for selection and implementation

of management activities.

Paramount to identifying the level of recovery possible for the endangered fish species is the characterization of the historic fish populations, including species diversity and abundance. To gain a better understanding of the changes from historic to current conditions, identification of the status and trends of native fish species is necessary. Specific research activities are designed to address the response of the current fish community to various flow regimes. Particular emphasis will be placed upon the response of the native and non-native fish species to various Navajo Reservoir releases. The life history of the endangered fish species will be determined within practical limits. Movement and habitat use patterns, reproductive habits, and young-of-year and juvenile distribution and occurrence will be emphasized. Efforts will be made to determine the response of the endangered fish species, including abundance and distribution, to flow regimes.

While efforts have been made to address fish health concerns in cultural and refugial environments, minimal attention has been given to determining fish health issues in wild populations. Studies of the San Juan River fish community have documented the widespread occurrence of external physical abnormalities. Initial results have indicated that bacterial infections, presumably due to environmental stresses, are adversely affecting fishes. Additional studies will be conducted to determine the identity, extent, and causes of fish health problems in the San Juan River.

Studies are underway to evaluate the genetic distinctiveness of San Juan River populations of Colorado squawfish and razorback sucker. These studies will be incorporated into any decision regarding the necessity for establishment of refugial populations or gene banks. If deemed necessary plans will be developed and implemented to protect the genetic resources of the endangered fish species. The need for an augmentation effort to restore or improve the status of endangered fish species will be determined and implemented. Currently, a captive-bred stock of razorback sucker from the San Juan River Arm of Lake Powell is maintained in a refugia. A portion of these fish are being used in field studies to delineate life history attributes of the species. These data will be used to determine the feasibility, utility, and type of augmentation necessary to assist in recovery of razorback sucker. Similar efforts for Colorado squawfish will be considered and evaluated, without interference with ongoing research activities on the species.

4.4. DETERMINE ROLES OF NON-NATIVE FISH SPECIES IN THE DECLINE OF NATIVE FISH SPECIES AND IMPLEMENT CORRECTIVE ACTIONS

In the Colorado River basin, non-native fish species have been implicated in the decline of the native fish fauna. Past and ongoing studies have indicated that habitat alteration and concurrent or subsequent introduction and establishment of non-native fish species result in depleted native fish populations or their

extirpation. Negative impacts of non-native fishes include predation and competition for limited resources (e.g., food and habitat). Studies to be accomplished under this objective will enable the identification and implementation of management actions to minimize or, if possible, eliminate adverse impacts of non-native fishes on native fishes.

As with the native fish community, it is necessary to characterize the distribution and abundance of non-native fish species. The identification of changes in the resident fish community with emphasis on the occurrence of non-native fishes can be related to other environmental changes for determination of cumulative effects.

Characterization of habitat use patterns of non-native fishes will determine the degree of overlap with native fish species habitat requirements. Fish communities in low velocity habitats are often numerically dominated by non-native species. Studies will be conducted to characterize interactions among native and non-native fishes in low-velocity habitats and to monitor responses of fish to flow mediated habitat availability.

While it is difficult to directly identify or quantify competitive interactions, the degree of commonality of food habits among native and non-native fishes can be characterized. Similarly, direct predative impacts may be identified through studies of food habits of non-native predators. Information from these studies will provide insights on the role of non-native species in the dynamics of the native fish community and need for measures to control non-natives.

The success in controlling non-native fish species will depend upon the variety and intensity of methods used. Flow manipulations to mimic the natural hydrograph and thereby diminish non-native fishes will not work alone. Management efforts must also include more intense regulation of the sport- and baitfish activities. Other methods, such as mechanical or piscicide removal may be implemented, if feasible.

4.5. DETERMINE THE OCCURRENCE, EXTENT, AND ROLE(S) OF WATER QUALITY DEGRADATION AND CONTAMINANTS IN THE DECLINE OF NATIVE FISH SPECIES AND IDENTIFY AND IMPLEMENT CORRECTIVE ACTIONS

The role of water quality degradation and contamination in the decline of native fish species of the Colorado River basin is not well understood. Preliminary research indicates that certain life stages of Colorado squawfish and razorback sucker are sensitive to elevated levels of several contaminants often found in the San Juan River. These results suggest additional studies to accurately characterize the effects of various water quality parameters (singly, synergistically, or antagonistically) are needed to improve management strategies for the endangered fish species. Studies and management activities outlined under this objective will address specific water quality impacts and necessary remedial actions.

Historical physical and chemical water quality of the San Juan River will be characterized using data from various sources, primarily that collected by the U.S. Geological Survey. Data gaps and informational needs regarding the type and source of water quality degradation and contamination will be emphasized.

Recent water quality studies have indicated that elevated levels of constituent elements and contaminants occur in the water and biota of the San Juan River. These pollutants are primarily related to agricultural, petrochemical/industrial, and municipal activities, but include a variety of other potential sources.

The biological effects of elevated constituent levels and contaminants on the endangered fish species will be determined by laboratory studies of hatchery-reared surrogates and, when possible, tissue analysis of wild specimens. Determination of the importance of the relative sensitivities of endangered fish species at different life stages will enable integration of this information with other factors which affect survival.

The comparative effects of unregulated Animas River and reservoir-controlled flows on selected physical-chemical water parameters in downstream reaches occupied by endangered and other native fish species will be evaluated. Water quality changes relative to hydrologic cycle and origin (i.e., mainstem San Juan River versus tributaries) will be qualified and quantified and related to known life history stage sensitivities. These data will assist in the selection of flow criteria designed to satisfy native fish requirements and to evaluate the efficacy of reservoir-controlled releases in providing needed environmental conditions.

4.6. DEVELOP AND IMPLEMENT AN INFORMATION AND EDUCATION PROGRAM TO INCREASE PUBLIC AWARENESS OF ENDANGERED FISH SPECIES AND THREATS TO HABITATS.

Without fail, every recovery planning document has identified the need for an increase in public awareness concerning resource protection, conservation (implying a certain degree of use), and, in some cases, preservation. The simple fact that intelligent use and management of natural resources, particularly those related to aquatic environments of the Southwestern United States, can accommodate maintenance of native fauna and flora and consumptive use (often ill-defined) is not well understood or perceived by the general public. This misunderstanding or misperception has been fostered by previous efforts to focus on the plight of a particular species or a small group of species rather than addressing the ecosystem that the species and, coincidentally, the general public depend upon. Thus, it is necessary to pursue appropriate public outreach programs that emphasize the similarity of needs of endangered species and the general public; both depend upon the same basic resource. That resource, simply put, is water; without that resource neither the endangered fish species nor the general public can exist in the San Juan River basin in perpetuity.

A variety of outreach tools will be employed to provide information to the public regarding the need and intent of the San Juan Recovery Implementation Program. These tools will include news releases, public meetings, presentations designed to provide information to the public and establish a forum for direct discussions, and program information dissemination. As appropriate, brochures, signs, and educational displays will be developed and used to educate the general and angling public about the reasons for and results of endangered species recovery.

4.7 DEVELOP, IMPLEMENT, AND MAINTAIN AN ADAPTIVE MANAGEMENT PROGRAM TO ENSURE CONDUCTING OF APPROPRIATE RESEARCH AND MANAGEMENT ACTIVITIES TO ATTAIN AND MAINTAIN RECOVERY OF ENDANGERED AND OTHER NATIVE FISH SPECIES.

A recovery program such as this for the San Juan River endangered fish species is only as effective as the method of self-evaluation and appropriate adjustment to meet the desired goal of recovery of the endangered fish species and management of the native fish community. It is necessary to continually analyze the influx of new or additional information regarding the biological, physical, and chemical conditions of the San Juan River basin. These conditions, coupled with socioeconomic realities of current and future water uses, will determine what, when, how, and why remedial methods will be employed to successfully implement recovery and management. It is therefore necessary to develop an adaptive management approach that allows timely incorporation of all available information to be used to evaluate the accuracy of such and adjust management actions as needed.

The LRP is based on adaptive management. It has been written to accommodate and encourage proactive measures to benefit the endangered fish species once such measures have been identified. The Seven Year Research Plan was designed primarily to conduct such research as was necessary to identify those actions and strategies that might contribute to the recovery of the endangered fish species. To force the process to identify specific recovery goals before basic research is complete would seriously compromise the integrity of any recommended actions. However, it is possible that measures to improve the status of the endangered fish species or their habitats will be identified before completion of the Seven Year Research effort. Testing of management recommendations is necessary before deciding on specific goals. Such testing will often require four or more years. Nevertheless, it is likely that some "recovery" measures may be implemented prior to 1997 or 1998. When it is appropriate, such measures will be recommended and evaluated.

A standardized and centralized database will be developed and maintained to ensure accurate compilation and storage of relevant biological data. This database will be made available to all resource agencies, institutions, and individuals conducting or evaluating research and management activities.

As research projects are completed or relevant findings verified, new information may identify additional research needs or identify immediate resource protection actions. Program management will allow for the conduct of new and approved research and implementation of necessary management actions.

A long-term monitoring program will be developed and implemented during this recovery program. Emphasis will be placed upon monitoring the status and trends of the resident fish community, geomorphology of the stream channel, flow/habitat relationships, changes in water quality, and hydrologic changes within the Basin.

As necessary, recovery actions and goals will be refined to reflect new information and the relative understanding of achievable management of the San Juan River fish community. Quantifiable recovery goals for Colorado squawfish and razorback sucker and management goals for the native fish community will be developed.

Peer review is essential to maintain the quality and integrity of all program activities. All study plans and completion reports will be reviewed at least by researchers on the Biology Committee and when practical by outside individuals knowledgeable of the topics addressed in individual reports. Researchers are encouraged to seek timely publication of research results in scientific journals and the Program will support such efforts.

5.0. LONG RANGE PLAN AND MILESTONES

A large variety of tasks have been identified as necessary to achieve the overall goals of the San Juan River Recovery Implementation Program. Achievement of specific milestones is typically dependent upon accomplishing several Tasks. Almost all Tasks contribute to the achievement of several milestones. The following sequence of objectives does not imply priority; rather, the sequence follows a logical progression in which basic research leads to more applied research and development of management strategies. Milestones in and of themselves do not constitute sufficient progress but may be used to help determine sufficient progress as specified in Section 4.2.1 of the San Juan River Recovery Implementation Program. Milestones are management decision points that allow evaluation of progress on the Program and provide direction for future actions. Sufficient progress will be determined by the U.S. Fish and Wildlife Service through the consultation process.

Progress towards goal achievement will include the following (not listed in priority and items are not necessarily of equal importance):

- ▶ Continuation of research to acquire data necessary to characterize and evaluate changes in biotic and abiotic conditions resulting from implementation of recommended recovery/management activities.
- ▶ Enhancement of habitats through flow manipulation, physical

alteration, water quality improvements, or other actions that positively contribute to recovery of the endangered fish species and management of the native fish community.

- ▶▶ Modification of current human activities which detrimentally impact or impair the quality of habitats.
- ▶▶ Acquisition of property or easements from willing and voluntary sellers for property which is identified as necessary for recovery.
- ▶ Quantifiable improvement in the status of native fish community, Colorado squawfish population, and razorback sucker population.

The above incorporates items listed in Section 4.2.1 of the San Juan River Recovery Implementation Program.

There is a considerable body of published and unpublished literature on western North American fishes (native and non-native), their biology, habitats, and ecological relationships. This information will be used, as appropriate, in planning, conducting research, interpreting research/management results, and recommending research and management activities.

The elements of the Seven Year Research Plan are incorporated in the LRP. Completion of these elements will allow improved quantification and prioritization of milestones and actions necessary to achieve the ultimate goal of recovery and conservation of the endangered fish species and management of the native fish community of the San Juan River basin.

The Tasks detailed in 5.1 through 5.7 are required to accomplish the objectives necessary for recovery of the San Juan River endangered fish species. Tasks are not listed in order of priority; rather, order of listing reflects the appropriate scheduling for successful and efficient accomplishment of objectives. In nearly all phases of the research program that is to be completed in 1997, tasks are concurrent with one another. Table 1 displays the integration of tasks required for development and implementation of management decisions as support for the listed milestones. Figure 1 graphically presents the timeline of task completion and portrays the concurrent nature of the tasks. Task completions that represent milestones are displayed as such.

Budgets outlining expenditures for research and management actions to accomplish recovery tasks will be approved on an annual basis by the Coordination Committee per Section 6.5 of the San Juan River Recovery Implementation Program.

5.1 DEVELOP INTERIM MANAGEMENT OBJECTIVES FOR THE ENDANGERED FISH SPECIES AND NATIVE FISH COMMUNITY OF THE SAN JUAN RIVER

- 5.1.1. Colorado squawfish population goal (Milestone).
- 5.1.2. Razorback sucker population goal (Milestone).
- 5.1.3 . Other native fishes population goal (diversity, abundance, distribution).
- 5.1.4 . Evaluate, integrate, and report research findings annually and make recommendations based upon these findings.

5.2 IDENTIFY, PROTECT, AND RESTORE HABITATS WITHIN THE SAN JUAN RIVER BASIN NECESSARY FOR RECOVERY OF THE ENDANGERED FISH SPECIES AND MANAGEMENT OF THE NATIVE FISH COMMUNITY

- 5.2.1. Characterize historic and current stream channel geomorphology and associated riparian zones.
 - 5.2.1.1 Determine geomorphically distinct reaches.
 - 5.2.1.2 Characterize habitat for each of the reaches.
- 5.2.2 . Determine changes in channel morphology from historic conditions and with changes in flow regime.
- 5.2.3 . Quantify and compare/contrast available aquatic habitats as a response(s) to natural and manipulated flows.
 - 5.2.3.1 Monitor the fate of habitat availability as a result of different flows.
- 5.2.4 . Model flow and habitat relationships.
- 5.2.5 . Determine and monitor habitat use of endangered and other native fishes.
 - 5.2.5.1 Determine habitat requirements for different life stages.
 - 5.2.5.2 Identify subreaches that provide habitats for the different life stages.
- 5.2.6 . Identify limiting habitats (Milestone)
- 5.2.7 . Identify, recommend, and implement flows designed to maximize and maintain suitable habitats for all life stages of

endangered and other native fish species (Milestone).

5.2.7.1 Identify and recommend flows.

5.2.7.2 Provide recommended flows.

5.2.8. Obtain legal protection for flows identified to recover endangered fish species (Milestone).

5.2.9 . Determine the need for and, if necessary, implement actions designed to accomplish non-flow physical habitat modification for endangered fish species.

5.2.9.1 Identify (Milestone)

5.2.9.2 Implement (Milestone)

5.2.9.2.1 Removal/alteration of instream barriers to fish movement.

5.2.9.2.2 Creation of required but unavailable habitats.

5.2.9.3.3 Modification to Navajo Dam outlet works.

5.2.10 Long term monitoring

5.3 IDENTIFY, PROTECT, AND RESTORE THE ENDANGERED FISH SPECIES OF THE SAN JUAN RIVER BASIN AND MANAGE THE NATIVE FISH COMMUNITY

5.3.1. Identify and characterize the historic and current fish species community structure.

5.3.2 . Determine the status and trends of the resident fish species.

5.3.3 . Determine the life history of endangered and other native fish species and relationships to all other resident fish species.

5.3.4 . Identify fish health aspects that negatively impact native fish species.

5.3.5 . Characterize fish species community response to different annual flow regimes.

- 5.3.6 . Identify limiting factors for the endangered and other native fishes (Milestone).
- 5.3.7 . Develop and implement a genetics management plan to maintain genetic diversity of the endangered fish species (Milestone).
 - 5.3.7.1 Collect tissues and characterize genetic makeup of endangered fish species (Milestone).
 - 5.3.7.2 Establish refugia populations of endangered fish species if warranted (Milestone).
 - 5.3.7.2.1 Cryogenic preservation of gametes.
- 5.3.8 . Determine the need for and implement, if necessary, an augmentation program to recover endangered fish species in appropriate historic habitat.
 - 5.3.8.1 Evaluate reproduction and recruitment potential.
 - 5.3.8.2 Develop augmentation plans for endangered fish species (Milestone).
 - 5.3.8.3 Develop hatchery broodstocks of endangered fish species of San Juan River origin.
- 5.3.9 . Long term monitoring program

5.4 DETERMINE THE ROLE(S) OF NON-NATIVE FISH SPECIES IN THE DECLINE OF NATIVE FISH SPECIES AND IMPLEMENT CORRECTIVE ACTIONS

- 5.4.1. Characterize distribution and abundance of non-native fish species.
- 5.4.2. Identify and characterize habitats used by non-native fish species and effects on native fish species habitat use.
- 5.4.3 . Describe food habits of non-native fish species and evaluate for predation and competition impacts on native fish species (Milestone).
- 5.4.4 . Characterize the response of non-native fish species to varying flow regimes and recommend flows that minimize or eliminate interactions with native fish species.

- 5.4.5 . Develop a non-native fish stocking policy (Milestone).
- 5.4.6. Develop and implement regulations to restrict baitfish species harvest within appropriate habitats (Milestone).
- 5.4.7. Develop and implement regulations to restrict import of non-native fish species (Milestone).
- 5.4.8 . Monitor and evaluate actions implemented to minimize or eliminate native and non-native fish species interactions.
- 5.5 DETERMINE THE OCCURRENCE, EXTENT, AND ROLE(S) OF WATER QUALITY DEGRADATION AND CONTAMINANTS IN THE DECLINE OF THE ENDANGERED FISH SPECIES AND IDENTIFY AND IMPLEMENT CORRECTIVE ACTIONS**
 - 5.5.1 . Identify and characterize historic water quality conditions of the Basin.
 - 5.5.2 . Identify and characterize the presence and extent of contaminants and their sources (Milestone).
 - 5.5.3 . Identify and quantify biological effects of contaminants on endangered and other native fishes (Milestone).
 - 5.5.4. Identify changes in water quality and compare to the hydrologic cycle by river reach and tributary.
 - 5.5.5. Recommend allowable contaminant levels (Milestone).
 - 5.5.6 . Identify and implement corrective actions to improve water quality and to minimize or eliminate contaminant sources necessary for recovery of the endangered fish species (Milestone).
 - 5.5.7 . Develop and maintain a database for all relevant water quality and contaminants data.
 - 5.5.8 . Develop and implement a monitoring program to evaluate efficacy of corrective actions.
- 5.6 IMPLEMENT AN INFORMATION AND EDUCATION PROGRAM TO INCREASE PUBLIC AWARENESS ABOUT ENDANGERED FISH SPECIES AND THREATS TO THEIR HABITATS**

- 5.6.1. Produce news releases and conduct public meetings and presentations.
- 5.6.2. Develop brochures, signs, and educational displays to educate the general and angling public about endangered fish species.
- 5.7 **IMPLEMENT AND MAINTAIN AN ADAPTIVE MANAGEMENT PROGRAM TO ENSURE CONDUCT OF APPROPRIATE RESEARCH AND MANAGEMENT ACTIVITIES TO ATTAIN AND MAINTAIN RECOVERY OF ENDANGERED FISH SPECIES. THE BIOLOGY COMMITTEE WILL MEET AS FREQUENTLY AS NECESSARY, BUT AT LEAST ANNUALLY, TO EVALUATE RESEARCH ACTIVITIES, MANAGEMENT ACTIONS, AND RECOVERY STRATEGIES TO REFINE AND IMPROVE THE PROGRAM FOR THE ENDANGERED FISH SPECIES OF THE SAN JUAN RIVER BASIN**
 - 5.7.1. Develop and implement a long-term standardized monitoring program to identify changes in the endangered and other native fish species populations, status, distributions, and habitat conditions (Milestone).
 - 5.7.2. Develop and maintain a standardized database for storage and retrieval of biotic and abiotic data.
 - 5.7.3 . Review and revise research activities to further define needs of and threats to endangered and other native fish species.
 - 5.7.4 . Evaluate and refine recovery actions, as necessary, to accomplish recovery goals.
 - 5.7.5 . Develop and refine quantifiable recovery goals.

Table 1. Outline and Schedule of Task Accomplishment and Milestone Achievement.

	Objectives	Milestone	Date		Tasks	Date
	5.1.1	Interim population goal for Colorado squawfish	1997		5.2.5	1996
					5.3.1	1995
					5.3.2	1997
					5.3.3	1995 etseq
					5.3.4	1996
					5.3.5	1995 etseq
					5.3.7 (Milestone)	1996
					5.3.8	1996
					5.4.3 (Milestone)	1996
					5.4.4 (Milestone)	1997
					5.7.3 (Milestone)	1994 etseq
	5.1.2	Interim population goal for Razorback sucker	1997		5.2.5	1996
					5.3.1	1995
					5.3.2	1997
					5.3.3	1997
					5.3.4	1996
					5.3.5	1995 etseq
					5.3.7 (Milestone)	1996
					5.3.8	1996
					5.4.3 (Milestone)	1996
					5.4.4 (Milestone)	1997
					5.7.3 (Milestone)	1994 etseq

Table 1. (continued)

	Objectives	Milestone	Date		Tasks	Date
	5.1.3	Interim population goal (diversity, abundance, trends distribution) for other native fishes	1997		5.2.5	1996
					5.3.1	1995
					5.3.2	1997
					5.3.3	1995 etseq
					5.3.4	1996
					5.3.5	1997
					5.3.8	1996
					5.4.3 (Milestone)	1996
					5.4.4	1997
					5.5.3	1996
					5.7.3	1994 et seq
	5.2	Identify limiting habitats	1996		5.2.3	1996
					5.2.5	1996
					5.3.3	1995 etseq
					5.3.5	1995 etseq
					5.4.2	1996
					5.4.4 (Milestone)	1997
					5.5.4	1996
					5.7.3 (Milestone)	1995 etseq
	5.2., 5.4	Flow recommendations	1997		5.2.3	1996
					5.2.4	1996
					5.2.5	1996

Table 1. (continued)

	Objectives	Milestone	Date		Tasks	Date
					5.2.6	1996
					5.2.7.1 (Milestone)	1997
					5.2.9 (Milestone)	1997
					5.3.5	1997
					5.4.4 (Milestone)	1997
	5.2	Implementation and protection of recommended flows	1998		5.2.7.2 (Milestone)	1998
					5.2.10 (Milestone)	1998
					5.4.4	1997
	5.2	Identify non-flow needed habitat modifications	1997		5.2.6	1996
					5.2.8.1 (Milestone)	1997
	5.2	Implement needed habitat modifications	1998		5.2.6	1996
					5.2.8.1 (Milestone)	1997
					5.2.8.2 (Milestone)	1998
	5.3	Identify factors limiting Colorado squawfish life stages	1997		5.1.1	1997
					5.2.6	1996
					5.3.6	1997
					5.5.3	
	5.3	Identify factors limiting Razorback sucker life stages	1997		5.1.2	1997
					5.2.6	1996
					5.3.6	1997
					5.5.3	

Table 1. (continued)

	Objectives	Milestone	Date		Tasks	Date
	5.3	Identify factors limiting other native fish species'	1997		5.1.3	1997
					5.2.6	1996
					5.3.6	1997
					5.5.3	
	5.3	Genetics Management Plan for Colorado squawfish	1996		5.3.7 (Milestone)	1996
					5.3.7.1	1995
	5.3	Establish refugia for Colorado squawfish, if necessary	> 1997		5.3.7.2 (Milestone)	> 1997
	5.3	Develop a genetics Management Plan for Razorback sucker	1996		5.3.7 (Milestone)	1996
					5.3.7.1	1994
	5.3	Establish refugia for Razorback sucker if necessary	1996		5.3.7.2 (Milestone)	1996
	5.3	Determine the need for augmentation of Colorado squawfish	1997		5.1.1	1997
					5.3.6	1997
					5.3.8.1	1997
					5.3.8.2	1997
	5.3	Augment the Colorado squawfish population if necessary			5.3.8 (Milestone)	
					5.3.8.2	
					5.3.8.3	
	5.3	Determine the feasibility of augmentation of Razorback sucker	1996		5.1.1	1996
					5.3.6	1996
					5.3.8.1	1996

Table 1. (continued)

	Objectives	Milestone	Date		Tasks	Date
					5.3.8.2	1996
	5.3	Augment Razorback sucker if feasible	1997		5.3.8.2 (Milestone)	1997
					5.3.8.3	1997
	5.4	Determine negative interactions of non-native fish species to facilitate control	1997		5.3.1	1995
					5.3.2	1997
					5.3.3	1997
					5.3.4	1996
					5.3.5	1997
					5.3.6	1997
					5.4.1	1997
					5.4.2	1996
					5.4.3	1997
					5.4.4	1997
	5.4	Develop and implement a non-native fish stocking policy	1995		5.4.5 (Milestone)	1995
	5.4	Restrict baitfish harvest	1995		5.4.6 (Milestone)	1995
	5.4.7	Restrict import of non-native fish	1995		5.4.7 (Milestone)	1995
	5.5.2	Identify contaminant sources	1997		5.5.2 (Milestone)	1997
					5.5.4	1996
	5.5.3	Quantify biological effects of contaminants	1996		5.5.3 (Milestone)	1996
	5.5.5	Recommend allowable contaminant levels	1997		5.5.3 (Milestone)	1997
					5.5.4	1996
					5.5.5	1997

Table 1. (continued)

	Objectives	Milestone	Date		Tasks	Date
	5.5.7	Identify and implement remediation actions for contaminants sources	1997 etseq		5.5.2	1997 etseq
					5.5.5	1997
					5.5.6 (Milestone)	1995
	5.6	Develop public information plan	1995		5.6 (Milestone)	1995
	5.7	Develop and implement long-term standardized monitoring program	1998		5.2.1.1	1993
					5.3.9	1998
					5.4.8	1998
					5.5.8	1998
					5.7.1 (Milestone)	1998
	5.7	Develop and maintain standardized database	1992 etseq		5.5.7	1994
					5.7.2 (Milestone)	1992 etseq
	5.7	Identify additional research necessary	1991 etseq		5.7.1	1998
					5.7.3 (Milestone)	1997 etseq
	5.7	Evaluate and refine recovery efforts	1998 etseq		5.2.7	1997
					5.2.8	1998
					5.2.9	1998
					5.3.7	1996
					5.3.8	1996
					5.4.8	1998
					5.5.6	1998
					5.6	1995
					5.7.4 (Milestone)	1998 etseq

Table 1. (continued)

	Objectives	Milestone	Date		Tasks	Date
	5.7.5	Develop quantifiable recovery goal for Colorado squawfish	2002		5.1.1	2002
					5.7.4 (Milestone)	2002
	5.7.5	Develop quantifiable recovery goal for Razorback sucker	2002		5.1.2	2002
					5.7.4 (Milestone)	2002
	5.7.5	Develop quantifiable recovery goals for the native fish	2002		5.1.3	2002
					5.7.4 (Milestone)	2002

Figure 1. Timeline for major tasks and milestones

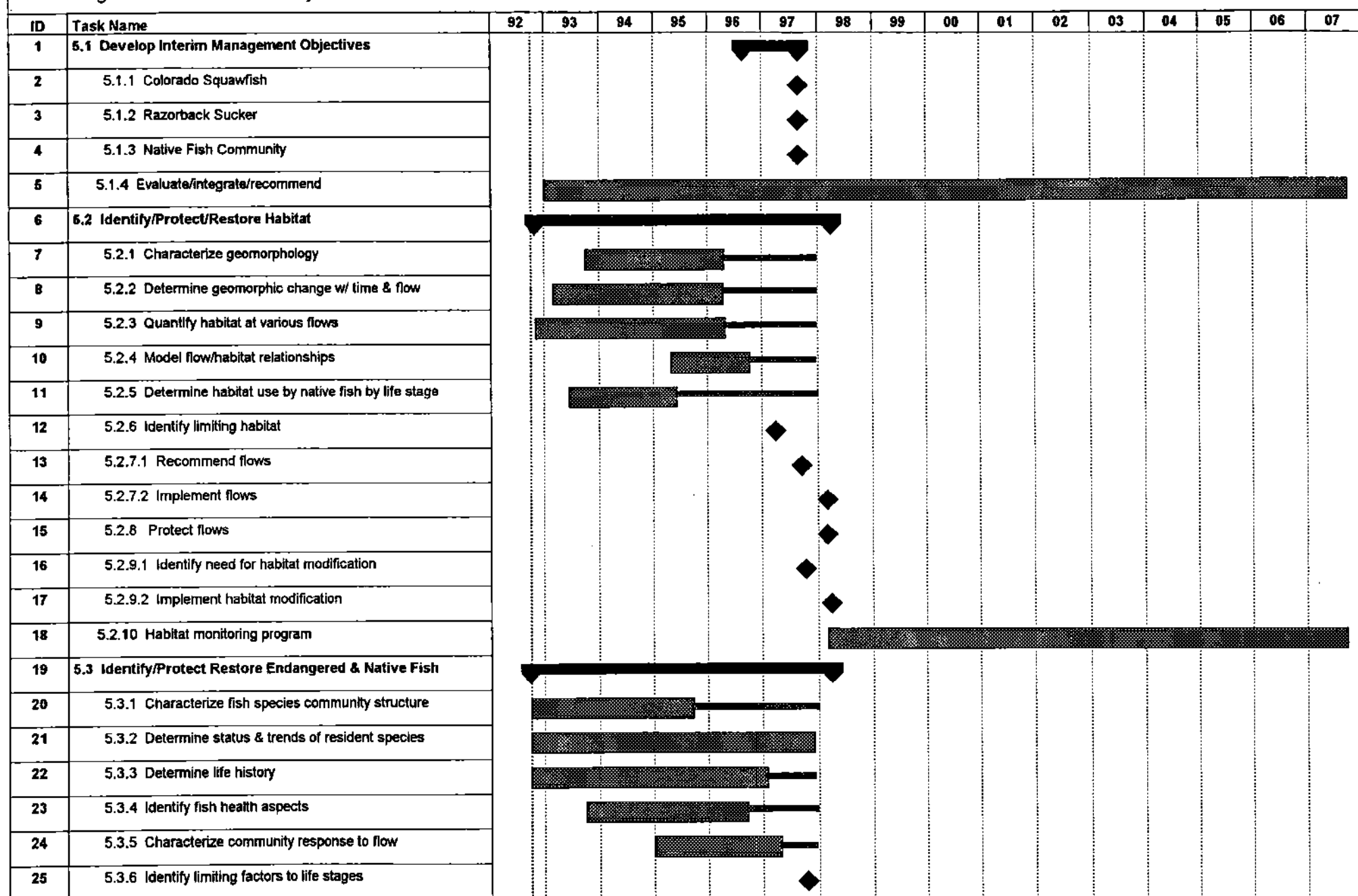


Figure 1. Timeline for major tasks and milestones

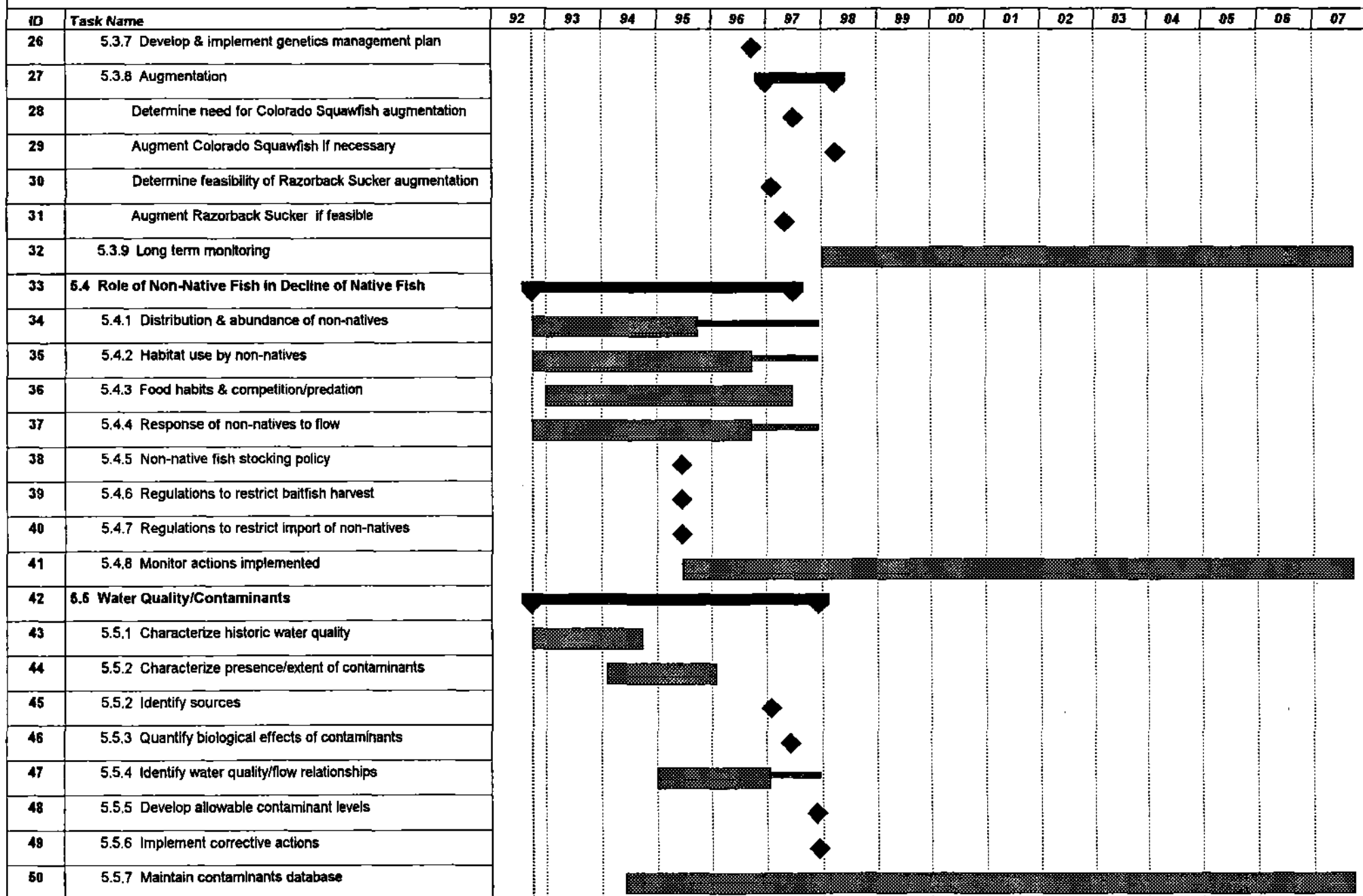
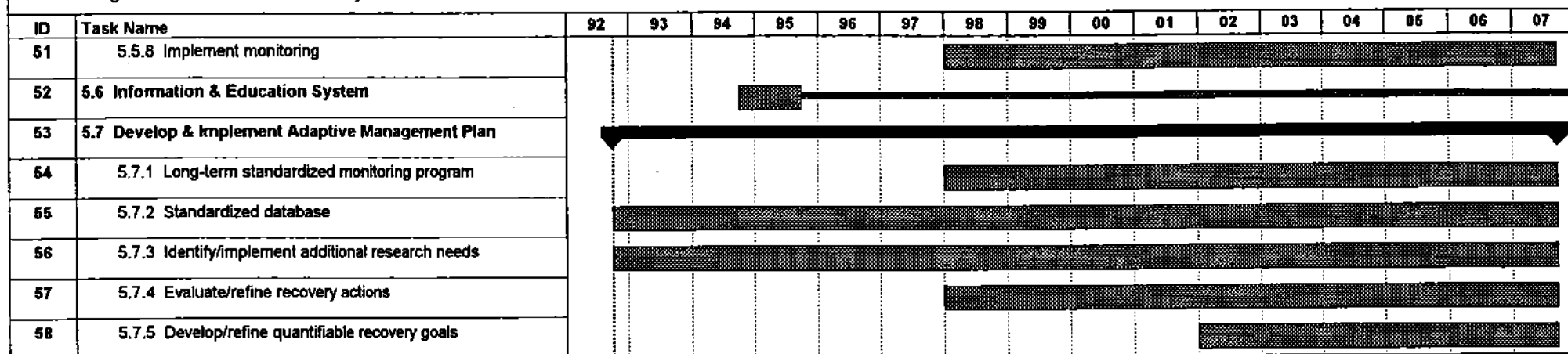






Figure 1. Timeline for major tasks and milestones



Task		Summary	
Milestone		Reduced Level	

IV. RIP SIDE BY SIDE ANALYSIS

SAN JUAN RIVER AND UPPER COLORADO RIVER BASIN



Upper Colorado River Basin and San Juan River Recovery Implementation Programs

Ecological Services

New Mexico State Office

December 1994

Upper Colorado River Basin and San Juan River Recovery Implementation Programs

The Upper Colorado River Basin and San Juan River Recovery Implementation Programs are cooperative, long-term programs of Federal, Tribal, and State agencies, environmental organizations, and water development interests aimed at re-establishing self-sustaining populations of endangered Colorado River fish species while providing for continued water development in these two river basins. The Upper Colorado River Program, administered by the Fish and Wildlife Service's Region 6, encompasses the Upper Colorado River upstream from Lake Powell, excluding the San Juan River. The San Juan River is included in its own Program that is administered by the Service's Region 2.

An important approach that is common to both the Programs is that they each can serve as "reasonable and prudent alternatives" for water development proposals (Region 6) or any action (Region 2) undergoing formal consultation under section 7 of the Endangered Species Act, when it is determined that a proposed action is likely to jeopardize the continued existence of the endangered fish. Of course, this interpretation is possible only when the proposed project or action is consistent with the terms of the respective Recovery Program.

The two Programs, by virtue of not only the time of their establishment (Upper Colorado RIP - 1988; and San Juan RIP - 1992), but of the river systems, land ownerships, and development activities within those systems, differ in their make up and in their approach. The Upper Colorado RIP deals primarily with the impacts upon the endangered fish and their designated critical habitats brought about through depletion of flows. The San Juan RIP encompasses other actions which may affect the survival and recovery of the endangered fish species, including not only water quantity, but water quality and physical habitat modification. These aspects of water quality and alteration of physical habitat are still subject to full section 7 compliance within the Upper Colorado basin, but they are not covered by the Recovery Implementation Program.

Another difference between the programs, arising from increased information gathered since the inception of the Upper Colorado Program, is the native fish community approach taken in the research and management actions of the San Juan Program. Native fish communities are still priority resource issues in the ecosystems of Region 6, but they are not included in the cooperative Program.

Since the establishment of both Programs, critical habitat has been designated for the endangered fish species. Questions have arisen concerning the flexibility of the programs to address the issue of adverse modification or destruction of critical habitat within their existing frameworks. The Service has informed participants of both programs that, as long as the programs continue to make documented, on-the-ground progress toward recovery of these fish, they can serve as reasonable and prudent alternatives for determinations of adverse modification of critical habitat as they have in the past for jeopardy determinations.

The following is an abbreviated side-by-side analysis of the two programs, much of the text has been taken from the agreements that established the programs or the documents guiding the on-the-ground conduct of the programs. We encourage the reader to obtain these documents for more details concerning the cooperative efforts of the Upper Colorado River Basin and the San Juan River Basin Recovery Implementation Programs.

Background, reasons for establishment

San Juan RIP

The San Juan River Basin Recovery Implementation Program was one of four components of the reasonable and prudent alternative provided in the October 25, 1991, Biological Opinion issued by Region 6 to the Bureau of Reclamation for the Animas-La Plata Project.

1. . . .only those Project facilities which result in a net annual depletion not to exceed 57,100 acre-feet will be constructed and operated pursuant to this biological opinion.

2. Reclamation has agreed to fund approximately 7 years of research effort on the San Juan River and its tributaries with emphasis on observing a biological response in the endangered fish population and habitat conditions. . . . The ultimate goal of this research is to characterize those factors which limit native fish populations in the San Juan River and to provide management options to conserve and restore the endangered fish community.

3. At the end of the approximately 7-year research period, the Navajo Dam would be operated to mimic a natural hydrograph for the life of the Project based on the research.

4. There shall be a binding agreement(s) that the reservoir releases (for both the study period and for the life of the Project) are legally protected to and through the endangered fish habitat to Lake Powell. This agreement will include a commitment for the appropriate parties to develop and implement a Recovery Implementation Program for the San Juan River within 1 year.

Upper Colorado RIP

In 1984, discussions among Federal and State (Colorado, Wyoming, and Utah) governments in the Upper Colorado River basin concerning the protection of endangered fish species and the proposed development of water resources of the basin resulted in the establishment, by a Memorandum of Understanding, of the Upper Colorado River Basin Coordinating Committee. Recognizing that earlier consultations under section 7 of the Endangered Species Act had found that new water projects would likely jeopardize the continued existence of the listed fish species, this committee was charged with the identification of reasonable and prudent alternatives that would preserve the species while permitting new water development to proceed in the upper basin. They concluded that a systematic approach was needed in order to achieve the committee's fundamental objective of accommodating rare fish species conservation with continued water resource development in the upper basin. This would best be achieved through a concerted and cooperative effort to recover all four species (Colorado squawfish, humpback chub, bonytail, and razorback sucker). As a consequence, the parties determined that a comprehensive program is needed to implement a broad range of measures designed not only to preserve the listed species but to ensure their full recovery and eventual delisting under the Endangered Species Act.

Purpose and Goals

San Juan RIP

...to protect and recover endangered fishes in the San Juan River basin while water development proceeds in compliance with all applicable federal and state laws... it is anticipated that actions taken under this Implementation Program also will provide benefits to other native fishes in the Basin and prevent them from becoming endangered in the future (San Juan RIP document 1992).

Upper Colorado RIP

...to recover the endangered fishes while providing for existing and new water development to proceed in the Upper Basin (Cooperative Agreement, 1988).

"The ultimate goal of this recovery program in the upper basin is to recover and delist the three endangered species and to manage the razorback so it would not need the protection of the Endangered Species Act" (Upper Colorado RIP Document 1987).



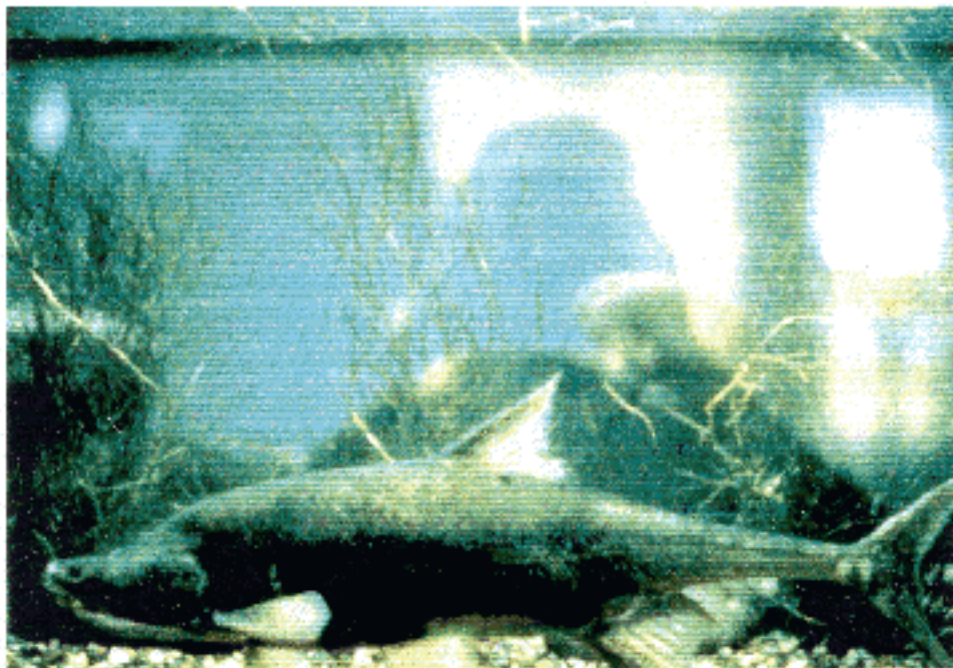
Historic projects

San Juan RIP

It is anticipated that section 7 consultations will be initiated for all existing federal actions within the baseline for the A-LP that are subject to consultation. The Service concluded that the reasonable and prudent alternative will offset 57,100 acre foot of depletion for the A-LP in addition to the depletions in the baseline. The operation of Navajo Dam to benefit the listed fish will be taken into account by the Service in its biological opinions on the depletion impact of these existing federal actions.

Upper Colorado RIP

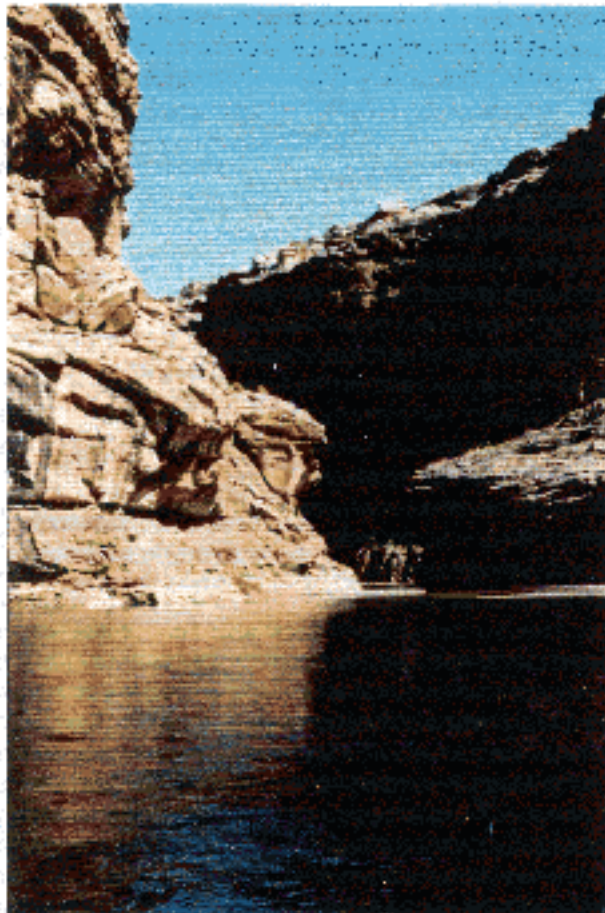
The Recovery Program is intended to offset both the direct and depletion impacts of historic projects occurring prior to January 22, 1988 (the date when the Cooperative Agreement for the Recovery Program was executed) if such offsets are needed to recover the fishes. An increase in depletions from a historic project occurring after January 22, 1988, will be subject to the depletion charge. As long as the Recovery Program is serving as the reasonable and prudent alternative, depletion charges or other measures will not be required from historic projects which undergo section 7 consultation in the future.



Section 7 consultation

San Juan RIP

Formal section 7 consultation is required for any federal action that "may effect" listed species or result in destruction or adverse modification of critical habitat. A conference is required if a federal action is likely to jeopardize the continued existence of any species proposed for listing as threatened or endangered, or result in the adverse modification of proposed critical habitat. The procedures and agency responsibilities under section 7 consultation must be followed for such federal actions in the Basin, including actions under this Implementation Program.



Upper Colorado RIP

Activities and accomplishments under the Recovery Program are intended to provide the reasonable and prudent alternatives which avoid the likelihood of jeopardy to the continued existence of the endangered Colorado River fishes (hereinafter the "reasonable and prudent alternative") resulting from depletion impacts of new projects and all existing or past impacts related to historic projects with the exception of the discharge by historic projects of pollutants such as trace elements, heavy metals, and pesticides. The Recovery Program also provides the reasonable and prudent alternative which avoids the likely destruction or adverse modification of critical habitat, to the same extent as it does to avoid the likelihood of jeopardy. (Recovery Implementation Program Recovery Action Plan (RIPRAP))

The Recovery Program does not provide the reasonable and prudent alternative for a new (nonhistoric) project's direct impacts (i.e., direct impacts, such as obstructions to migration routes, alteration of physical occupied habitat or critical habitat, construction, inundation, or temperature modification from reservoir releases, etc.). The Recovery Program identifies river reaches which are extremely important to the protection and recovery of the endangered fishes. Proposed actions which would result in direct impacts to these areas would likely result in a situation for which no reasonable and prudent alternative exists.

Minor depletions

San Juan RIP

In rendering biological opinions on federal actions resulting in minor depletions, the Service will consider all new information concerning project impacts and the status of the listed species, and good faith implementation of this Implementation Program in determining if sufficient progress toward recovery has been made to offset depletion impacts, or any other project-induced impacts on listed fish. It is understood that the aggregate of all minor depletions subject to section 7 consultation during the 7-year research period may result in a total annual depletion of not more than 3,000 acre-feet.

Upper Colorado RIP

The Service has generally determined that the Recovery Program has made sufficient progress for projects which deplete less than 3,000 acre feet (average annual depletion) to go forward subject to payment of the depletion charge (only new depletions are subject to the depletion charge). For depletions greater than 3,000 acre feet, the determination of sufficient progress will be made on a project-by-project basis. (Generally, the Service has determined that there has not been sufficient progress for projects greater than 3,000 acre feet). Generally, the Service's sufficient progress determination is reviewed annually in conjunction with the annual review and update of the RIPRAP.

On July 5, 1994, the Service issued an intra-Service biological opinion which exempted depletions of 100 acre-feet or less from the depletion fee required by the Recovery Program.



Definition of sufficient progress

San Juan RIP

The Service will determine if sufficient progress has been made under this Implementation Program based on the best available biological data and professional judgement. The Service will assess progress toward recovery in proportion to the potential jeopardy impacts of a proposed federal action.

Actions that constitute progress toward recovery are those expected to lead to a positive biological response of the endangered fish species (including, but not limited to, increased abundance, improved health, improved or increased survival) or improvement of their habitat (including, but not limited to, the availability, extent, or quality of those habitats).

Actions undertaken by the Recovery Implementation Program, in and of themselves, may or may not constitute progress sufficient to offset potential jeopardy impacts to the endangered fish species from a proposed federal action. The measure of sufficient progress will be the biological response of the fish and or their habitats to the action taken.

If the Service finds, in the course of a section 7 consultation, that progress under the Implementation Program is not sufficient to offset potential jeopardy impacts of a proposed federal action, it shall discuss (a) the basis for its finding with the federal agency and any applicant and (b) the availability of reasonable and prudent alternatives that the agency and the applicant can take to avoid a violation of section 7(a)(2) of the Endangered Species Act.

Upper Colorado RIP

The Service will determine progress by the Recovery Program based on:

- a. Completion of recovery actions which result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction.
- b. Status of fish population.
- c. Adequacy of flows.
- d. Magnitude of the impact of projects.

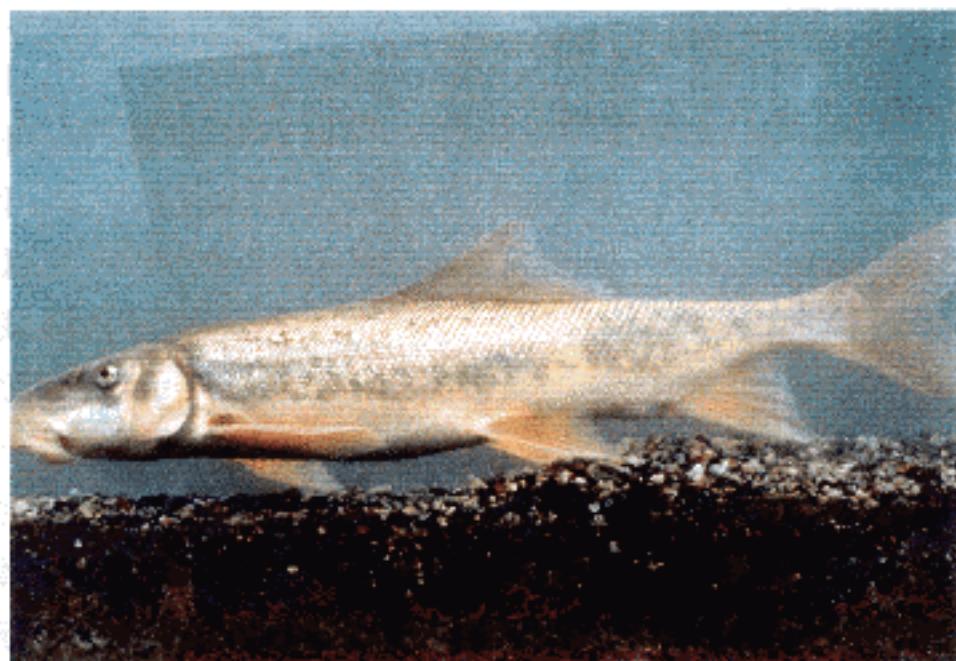
The Service will use accomplishments under the Recovery Program as its measure of sufficient progress.

If sufficient progress is not being achieved, biological opinions for new and historic projects will be written to identify which action(s) in the Recovery Implementation Program Recovery Action Plan (RIPRAP) must be completed to avoid jeopardy. The Service will confer with the Management Committee on the identification of these actions within established timeframes for the section 7 consultation. For historic projects, these actions will serve as the reasonable and prudent alternative as long as they are completed according to the schedule identified in the RIPRAP. For new projects, these actions will serve as a reasonable and prudent alternative so long as they are completed before the impact of the project occurs.

If the Recovery Program cannot be restored to provide the reasonable and prudent alternative, as a last resort the Service will develop a reasonable and prudent alternative, if available, with the lead Federal Agency and the project proponent.

Depletion charges

San Juan RIP	Upper Colorado RIP
None	<p>As a means of avoiding jeopardy, a one time charge is assessed to all projects subject to section 7 consultation which result in a <u>new</u> depletion of water from the upper basin. The depletion charge is based on the projects average annual depletion. In FY 95, the depletion charge is \$12.71/acre foot. The depletion charge is adjusted annually for inflation. Depletion charges are paid to the National Fish and Wildlife Foundation, it goes into an interest bearing account dedicated to supporting recovery actions for the endangered Colorado River fishes. No depletion charge will be required on depletions from Bureau of Reclamation projects as long as it continues its contributions to the Recovery Program's annual budget.</p>



Scope

San Juan RIP

The San Juan Recovery Implementation Program is designed to act, if sufficient progress toward recovery is determined by the Service, as a reasonable and prudent alternative to actions within the basin that are found likely to jeopardize the continued existence of listed aquatic species or result in the adverse modification or destruction of critical habitat in the Basin.

Upper Colorado RIP

The Upper Colorado Program, if sufficient progress toward recovery is achieved, is designed to act as the reasonable and prudent alternative to avoid the likelihood of jeopardy to the listed fish species and destruction or adverse modification of their critical habitat for depletion impacts of new projects and all existing or past impacts related to historic projects with exception of discharge of contaminants. The direct impacts of new projects (obstructions to migration routes, alteration of physical occupied habitat or critical habitat, construction, inundation, or temperature modification) are not offset by the Program as a reasonable and prudent alternative.



Long Range Implementation Plan

San Juan RIP

The plan will establish the milestones to be utilized in analyzing progress of this implementation Program. The research plan developed as a part of the section 7 consultations for the Animas-La Plata and Navajo Nation Indian Irrigation Project will be used as a basis for the overall research plan to assure that the conditions of the consultations are met.

The Long Range Implementation Plan will indicate the logical progression and priority of implementing identified recovery actions which are expected to result in recovery and delisting of the Colorado squawfish and razorback sucker. As such steps are completed, they constitute the milestones marking progress in achieving the goal of recovery of the endangered fish species. So long as the milestones established in the Long Range Implementation Plan are met, it is the mutual expectation of the Participants that this Recovery Implementation Program will serve as the foundation for a reasonable and prudent alternative for section 7 consultations, but shall not preclude the development of reasonable and prudent alternative independent of the Implementation Program.

Upper Colorado RIP

The RIPRAP was finalized in 1993 which identifies the feasible actions currently believed to be required to recover the endangered fishes in the most expeditious manner possible in the upper basin. The RIPRAP is intended to provide an operational plan for implementing the Recovery Program including development of the Recovery Program's annual work plan and future budget needs. The RIPRAP also identifies the specific recovery actions which must be accomplished in order for the Recovery Program to serve as the reasonable and prudent alternative to jeopardy and adverse modification of critical habitat (as described above). The RIPRAP was developed using the best information available and the recovery goals established for the four endangered fish species. The plan is considered an adaptive management strategy because additional information, changing priorities, and the development of the States' entitlement may require modifications to the RIPRAP.
